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ANOTHER YEAR'S PROGRESS IN THE MINERAL DEVELOPMENT OF THE PHILIPPINE ISLANDS

VOL. II: No. 10. MANILA, SHANGHAI AND YOKOHAMA, MARCH, 1906 25 cents, U. S. Cy. 50 " Philippine Cy.

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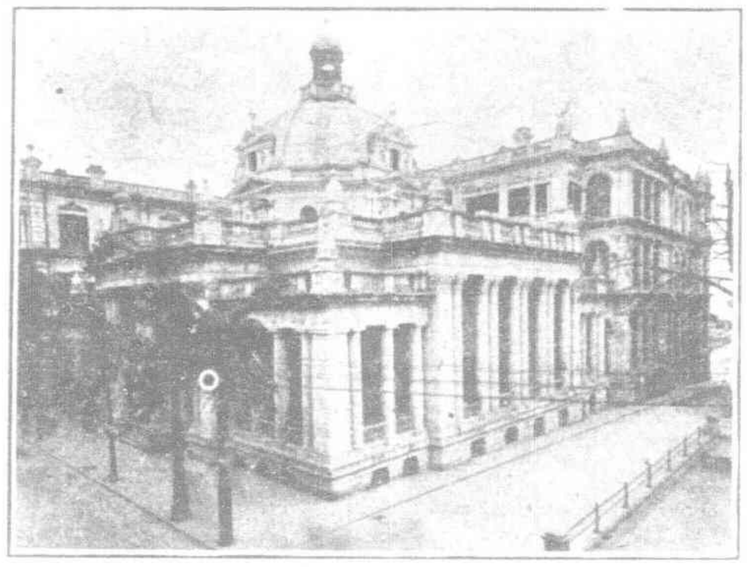
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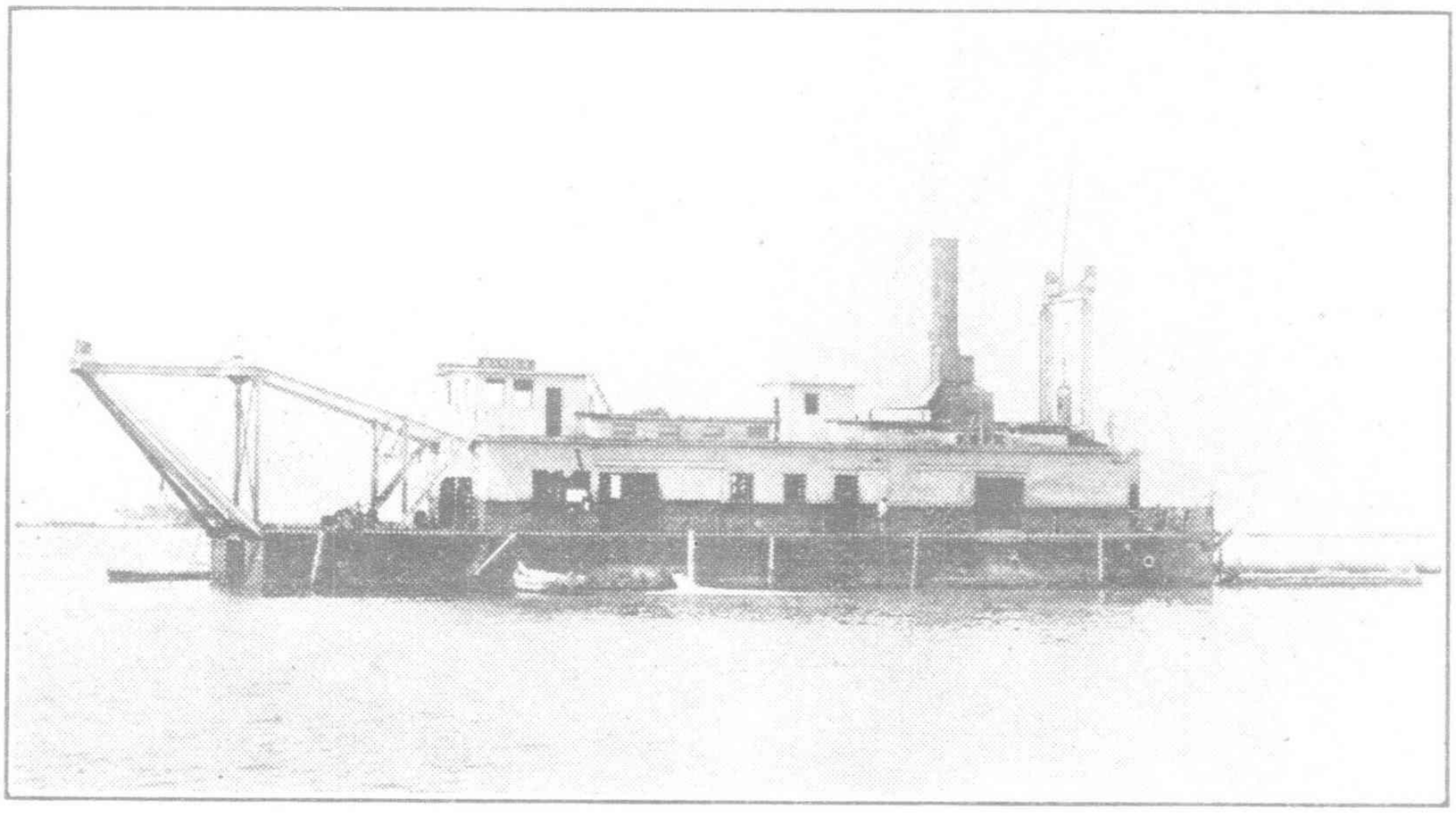
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THE FAR EASTERN REVIEW

COMMERCE ✪ ENGINEERING ✪ FINANCE

VOL. II. MANILA, P. I., SHANGHAI, AND YOKOHAMA, MARCH, 1906. No. 10.

ANOTHER YEAR'S PROGRESS IN THE MINERAL DEVELOPMENT OF THE PHILIPPINE ISLANDS

The sixth and last annual report of Mr. H. D. McCaskey as chief of the Mining Bureau of the Philippine Islands, now incorporated as a division of the Bureau of Science, which has just been published, is a most interesting doc ument and contains an abundance of valuable information covering the mineral resources and the mining prospects in this archipelago. Mr. McCaskey expresses the belief that the outlook for a profitable mineral industry in the Philippines is more hopeful today than it has been any time since American occupation. An increasing interest is being shown in mineral claims, and capital will probably be more readily obtained in the future than it has been in the past, particularly if the congress at Washington will immediately make a liberal modification of the mining laws of the Islands, which there is sincere hope will be done during the present session of the national legislators. Mr. McCaskey expresses the belief that the law of the *survival of the fittest* has held good in these Islands, as elsewhere, in the mining industry, and that the most promising mining claims heard of today are many of them worthy of serious consideration.

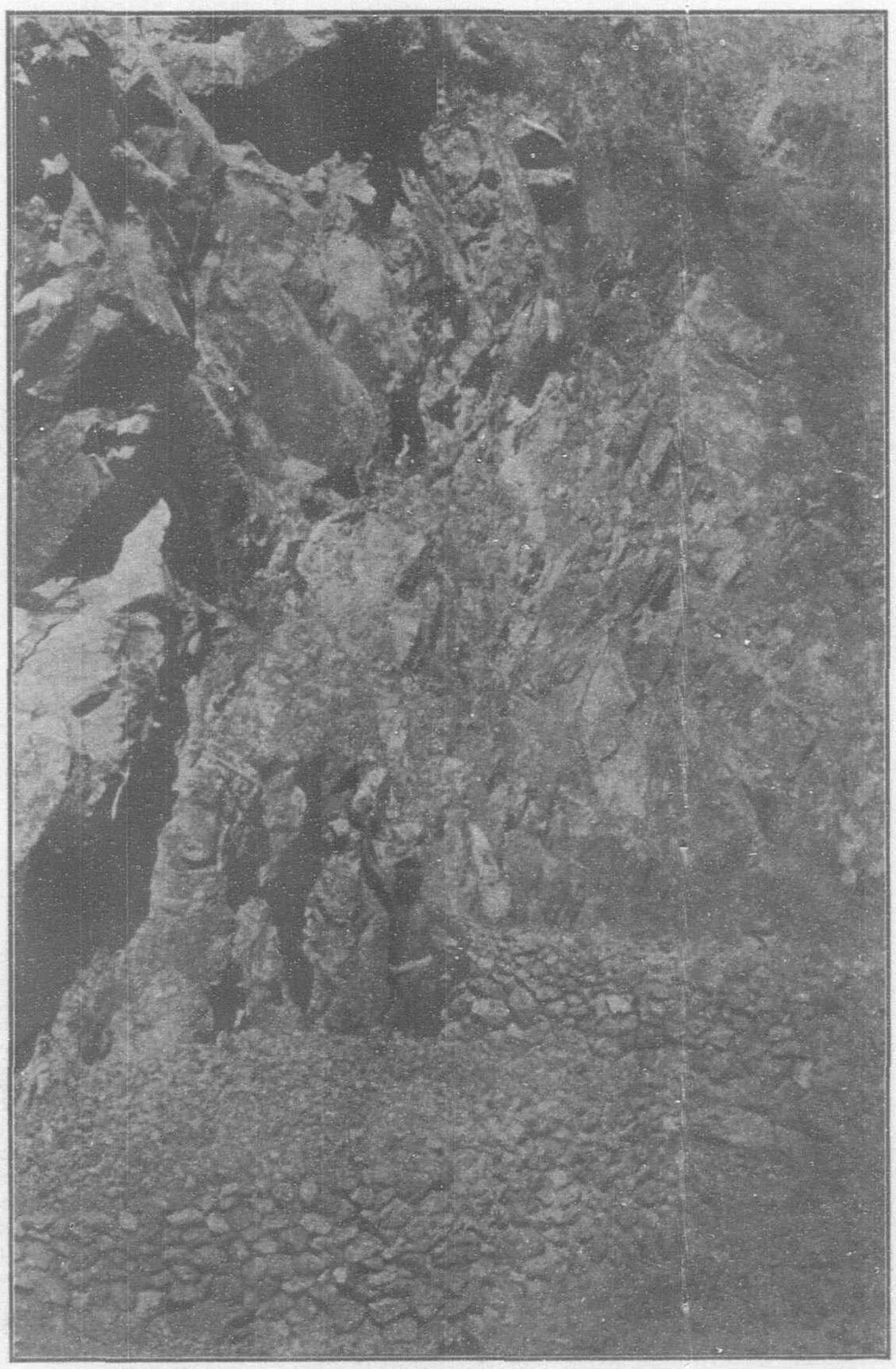
Much activity in prospecting and development work was shown in several districts during the period under review, modern machinery has been arriving from the United States, and more of it has been ordered and is expected to arrive at a very early date.

Mining development, or prospecting, are now being carried on in the provinces of Lepanto-Bontoc, Benguet, Pangasinan, Nueva Ecija, Bulacan, Rizal, Batangas, Tayabas, Ambos Camarines, Albay, Masbate, Cebu, and Mindanao.

(Continued on page 270.)



IGOROT GOLD WORKINGS, ANTAMOK RIVER, BENGUET, LUZON



"COPPER KING" DEPOSITS, BUED RIVER, BENGUET

THE FAR EASTERN REVIEW

GEO. BRONSON REA, M. E.
PUBLISHER AND EDITOR

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A MONTHLY REVIEW OF FAR EASTERN TRADE, FINANCE, AND ENGINEERING. DEDICATED TO THE INDUSTRIAL DEVELOPMENT AND ADVANCEMENT OF TRADE IN THE PHILIPPINES AND FAR EASTERN COUNTRIES.

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MANILA, SHANGHAI, AND YOKOHAMA, MARCH 1906

MINERAL DEVELOPMENT OF THE PHILIPPINES

There is much that is of interest to mining engineers and prospectors, who have been laboring to bring to the surface the hidden mineral wealth of the Philippine Islands, in the last annual report Mr. H. D. McCaskey is likely to make as chief of the Mining Bureau of the insular government. In this document Mr. McCaskey not only pays a high and deserved tribute to those gentlemen who have so ably assisted him in exploration work, but expresses in strong words of appreciation his regard for the miners who have cast their lot in this field of labor. Mr. McCaskey hopes and believes "that the sturdy pioneers who have blazed the trail through many a heart-breaking day in fever swamp, jungle, and forest, during years of peril and privation, the full tale of which will never be told, will yet come into their own, and through them that the mineral industry of the Philippines will prove an important factor in the development of prosperity and progress under American rule." Mr. McCaskey shows that on the whole the mineral industry of the Islands has steadily grown, and while he is optimistic of the future he insists that much depends upon more liberal mining laws, and the settlement of the labor and transportation problems. He believes in the worth of Filipino labor, but he admits there is any amount of difficulty yet to be overcome before the native can be brought around to realize the great benefits which accrue to the individual and the country-at-large, in the rounding out of a career of industry.

We find in Mr. McCaskey's report mention of nearly every valuable mineral known to the mining world, so the fact that these minerals exist here is indisputable. The period of misgivings and doubt as to the extent of the deposits, and their value, are a thing of the past. Time and capital, backed by modified laws, are now the only requisites lacking for rapid mineral development.

Probably the most important work done by miners during the period covered by Mr. McCaskey's report has been the development of the commercial value of Philippine coal. A number of coal mines have been opened, and impartial tests of their product seem to indicate that it is equal, if not superior, in grade and quality, to either Australian or Japanese coal. This encouraging feature of the field work performed by Mr. McCaskey and his assistants, with the help of private miners, seems to have brought out promises of much commercial benefit in years to come.

Gold, copper, and iron are being developed with most satisfactory results, which, while promising no bonanza, indicate to a certainty the future importance of these minerals in the industrial development of the Islands.

Surprising economy marked the conduct of the old Mining Bureau by Mr. McCaskey, and with all due regard for the officials who found it necessary on the ground of economy to consolidate the bureau with others in the Bureau of Science, we believe a serious mistake has been made. We have always felt a certain interest akin to pride in the Mining Bureau, and we have never been able to agree with others that wisdom was shown in its abolition. We believe the mineral resources of the Islands are of sufficient importance to warrant the maintenance of a separate bureau from which to develop them. If we are in error in arriving at this conclusion our ignorance of the value of mining in the development of a country has misled us. Agriculture and forestry have escaped contraction in the reorganization of the governmental departments and bureaus, and this being a fact we believe that mining and the mineral resources have received a serious setback in their not being kept absolutely and intactly separate and distinct for any other branch of the government. It is true that the consolidation in the Bureau of Science will make it more convenient for the laboratory work required in the mining division, but the results, we are afraid, will be harmful to the industry. We sincerely hope the government will reconsider this feature of the reorganization and give to the mining industry the recognitiou and impetus it deserves by detaching it as a separate bureau of the public service at a very early date. This is what miners are hoping for, and it is a concession they are entitled to.

AMERICA'S ORIENTAL TRADE

According to a memorandum issued by the Bureau of Statistics of the Department of Commerce and Labor at Washington, no feature of the export trade of the United States in 1905 has shown a larger growth than that of the trade with China and Japan, and this, in the case of China, despite the general boycott movement, which, while nearly all foreign interests felt its effect, was and yet is most severe against Americans. In 10 mos. ended with October, exports to China were more than $50,000,000 gold in value, against $20,000,000 in the same mos. of 1904 and $13.000,000 in the corresponding mos. of 1903; and those to Japan were $46.500,000 against a little less than $22,000,000 for the same period in 1904 and $16,000,000 in the corresponding mos. in 1903.

Increase in exports from the United States to each of these countries occurred in a large proportion of the articles of export to the Far East. To China the growth was especially marked in copper, cotton cloths, flour, sewing machines, locomotives, paper, canned beef, manufactures of tobacco, and lumber, though cotton cloth and copper were by far the most important of these items. To Japan the growth occurred in flour, carriages and other vehicles, raw cotton, electrical machinery, sewing machines, locomotives, leather, paper, canned beef, tobacco, and lumber.

Copper exports to China are a comparatively new feature of United States trade with that country, the amount in 10 mos. ended with last October having been $11,326,407 gold, gainst $611,677 in the same mos. of 1904. This copper is used in manufacturing the new copper coins, of which 1,693,000,000 pieces of a nominal value of about ½ cent each were coined in 1904.

To Japan the increase occurs in raw cotton, of which the exports in 1905 were 138,521,618 lbs., against only 23,499,526 lbs. in the same mos. of 1904 and 32,951,175 lbs. in 1903. The value of the cotton exports to Japan in the 10 mos. ended in October, 1905, was $13,784,399 gold, against $2,716,529 in the same mos. of 1904 and $3,214,427 in 1903.

CHINESE LABOR IN THE TRANSVAAL.

On other pages of this issue of THE REVIEW appears a very interesting description of the manner in which coolies have been collected in China and prepared and transported to the Transvaal, under contract, to labor in the gold mines of the Witwatersrand District. Appearing as it does right at this time when the question of indenturing this labor has developed into a bitter political hullabaloo in Great Britain, we believe the article should have great weight in favor of a continuation of the system, which, it would seem, has for the present been abandoned. The article appears practically in the form of an official report made by Mr. Ragsdale, American consul-general at Tientsin, to Washington. It exhausts the subject so far as the system of exportation from China is concerned, and its tenor throughout is highly complimentary to the contractors who have undertaken to secure the laborers for the Transvaal Chamber of Mines, and to the other parties interested in the scheme. If the same humane and business-like methods which have characterized the work in China, have been adhered to in the Transvaal—which we believe to be a fact—we can see no reason why the people of Great Britain should have seized upon the cry of "slavery," set up by the political enemies of the Balfour Government, to help them secure control of the government. However, it appears, according to Mr. Balfour's own admission, that this same labor problem was the cause of the downfall of his ministry. Now, we have no intention of discussing the political phase of the proposition We will leave the British politicians to denounce the indenturing of coolies as "slave trading" or whatever else they may choose to call it, and turn to the causes which forced the mine operators of the Rand to seek labor in a foreign land.

Mr. Ragsdale tells us about this in his report. He tells us that the climate of South Africa is such that it is impossible for the mine operators to secure white men as laborers, because the latter can not sustain themselves on the wage they earn and uphold their self-respect. The Kaffir and other natives of Africa have been tried and have failed on account of their indolence and absolute disinclination to work. After many dis-

heartening attempts to solve the labor problem, and only after the gold-mining industry of the Transvaal had dropped to the lowest ebb, the mine operators turned to China with her teeming millions of coolies for relief. The result was the indenturing, under most liberal regulations, of the coolie. Mr. Ragsdale tells us about the inception of the movement, the methods of collecting, detention, and examination, and the transportation of these laborers. The details are very interesting to every man or set of men interested in Oriental labor, and we believe Mr. Ragsdale has not departed from the bounds of conservative observation in what he has written.

Our esteemed friend, the *South China Morning Post*, believes that the good people of Great Britain have displayed gross ignorance of the whole transaction in letting the "slavery" bugaboo influence them in their recent general elections, and says that the "British view of the coolie labor—as interpreted by and during the general elections—is a nauseating and insulting one to the educated Chinaman, who has some shred of patriotism and respect for himself and his nationals," because the whole scheme of indenturing the coolies had the hearty support and coöperation of the Peking Government. Besides, this paper has "cogent and conclusive facts" before it as to the vital need of the perpetuation of the present system if South Africa is to flourish as one of Great Britain's most wealthy possessions, and these facts follow:—

"Recently the Chamber of Mines at Johannesburg issued a memorandum showing the dependence of the gold industry on Chinese labor. The following figures represent the immediate development of the industry which is contemplated if more labor is available during the next 12 mos., but for which no orders will be given if no more Chinese are imported. Stamps to be erected, 3,740; value of plant and machinery incidental thereto, £10,103,207; value of spare parts of machinery, stores, and supplies required in connection with the above during the first yr. after completion, £2,180,661; number of additional European skilled laborers employed, 5,912; annual local expenditure, £5,918,424. These figures indicate the loss to the industry and to the community in general which would be entailed by an abandonment of the work for which provision has been made in expectation of a steady supply of coolie labor. If the importation of Chinese were suspended, and those already in the country or due were repatriated, the actual losses are estimated as follows:—Stamps hung up 3,135; value of plant and machinery incidental thereto, £11,235,756; skilled whites dismissed, 6,405; decrease of local expenditure, £6,636 327. The chamber further points out that the December output of gold was obtained from the working of 7,335 stamps. If 3,135 stamps were hung up, the output would be reduced approximately 40 per cent. The facts speak for themselves. The retention and expansion of white labor rests on the amount of coolie labor procurable, and this statement has been amply corroborated this week by a gentleman who is employed in Johannesburg, and who definitely asserted to us that in the influx of coolie labor alone was vested the future of South Africa and the development ot the mining industry."

THE ORIENT AND SOUTH AMERICA

The Toyo Kisen Kaisha (Oriental Steamship Company) has ordered two steamers of over 13 000 tons to be built at Nagasaki, ostensibly for its South American line recently established. It is more than probable, however, that when these large ships are finished they will be berthed in the San Francisco service, and that the three Toyo Kisen Kaisha vessels now on that route will run to South America. The keel of one of the 13,000 ton ships has already been laid, and both are expected to be completed in 2 yrs. Until it has steamers of its own, the company will employ chartered vessels, the first one to be placed on the run being *Glenfarg*, a British bottom.

The route is from Hongkong *via* Japanese ports to Honolulu and San Francisco; and then to Panama, Guayaquil, Callao, and Iquique. The list of ports of call will depend much upon the business offering and the route on the return voyage will be determined by the quantity of freight secured. It may be direct, with a call for coaling at Honolulu, or it may include stopping for passengers or freight in Mexico, or even at San Francisco. Chinese goods and passengers for South America will be largely counted upon for business, as it is thought that a great number of Chinese laborers will go to Peru in the near future. Nitrates, for fertilizers, and Peruvian sugar are the main return cargoes anticipated.

La Compagnie Francaise des Chargeurs Reunis recently despatched its first steamer, advertised to go to Europe *via* the Straits of Magellan and Buenos Aires. Among her cargo were a miscellaneous lot of Japanese goods for Argentina. This company advertises a bimonthly service to be maintained by five new ships, each of 5,416 tons. Announcement is made that this line also is not fully organized. The proposed route is from Antwerp *via* Mediterranean ports and Suez to Singapore, Hongkong, Yokohama, Honolulu, San Francisco, Panama, the ports of the W. coast of South America and *via* the Straits of Magellan to Rio de Janeiro. The return voyage will be across the Atlantic Ocean to Antwerp. It is understood that the French company has a promise of about 2,000 tons of copper per month as cargo from Peru to Europe, and that is its main dependence in initiating the service.

Hitherto there has been no considerable trade between Japan and South America, but interest in the commercial possibilities, according to Secretary Wilson of the American Legation at Tokyo, is now being rapidly awakened. The Argentine representative at the Japanese capital has suggested to his government the establishment of a museum of Argentine merchandise at Tokyo. It is not unlikely that an important commerce between Japan and the countries of South America may follow this opening of cheaper communication. The Japanese expect to find a market there for manufactured silk, matting, straw braid, straw hats, porcelain, fans, paper, matches, bamboo articles, lacquerware, wooden manufactures, etc. South American articles of export which may find a return market in Japan are leather, hides, cotton, wool, nitrates, sugar, fodder, and wheat.

The starting of regular Japanese lines to South America indicates the far-reaching commercial enterprise of the Japanese in their determination to have a merchant marine of the first magnitude. With a large seafaring population, low wages, cheap coal, and liberal government subsidies to steamship companies, the Japanese will reach out for a good share of the lucrative carrying trade of the world.

MORO PROVINCE ILLUSTRATED

THE FAR EASTERN REVIEW has in course of preparation a special edition of the paper which will be devoted exclusively to the Moro Province of the Philippine Islands, which country is, today, the Mecca in this archipelago for white settlers. The progressive administration of the Government of the Moro Province has given an impetus to the development of its resources and commerce which promises for the people general prosperity; and this, combined with the natural richness of the country, should be a temptation to white settlers. Our special edition will deal entirely with the progress of provincial engineering improvements under American rule, the agricultural, mineral and forestry resources of the country, and the upbuilding of commerce and trade among the people. The edition will be profusely illustrated and will contain a fund of most interesting reading matter and data pertaining to every phase and condition of the country and its possibilities. In order to make the edition absolutely reliable in every particular we commissioned Mr. J. L. Travis, an experienced newspaper writer, to cover the field. He has been in the Moro Province for more than 2 mos., and before he finishes his work will have visited every "nook and corner" of the land and made personal and accurate investigation of every feature the special edition will seek to cover

The Moro Province edition will number more than 10,000 copies and will be circulated only on special order. It will be published not later than May 15th. Price 25 cts. gold per copy, mailed to any address in the Postal Union. All orders should be sent to the publication office of THE FAR EASTERN REVIEW, Manila, P. I.

PHILIPPINE AGRICULTURE MENACED

We are informed on reliable authority that the rigid enforcement of insular customs and coastwise laws, wherein, it seems, the pound of flesh has been indiscriminately exacted, has forced the manager of the great agricultural implement and machinery depôt of The Kelly-Springfield Road Roller Company, in Manila, to abandon this city as headquarters, in favor of Hongkong. We hope Mr. W. Cameron Forbes, Secretary of Commerce and Police, will give this matter his immediate attention and, if possible, neutralize difficulties to the end that the Kelly-Springfield people may not be forced to withdraw their agency. What this country needs more than anything else is agricultural machinery. Realizing this and satisfying themselves that there was a splendid field here for their manufactures, the Kelly-Springfield people, who are in reality a combination of 13 of the largest American machinery manufacturing concerns, at an expenditure of thousands of dollars, shipped many tons of their best agricultural implements to this city to be placed in the farming and planting districts of the Philippines Their exhibition depôt is a magnificent institution, and it seems to us that it would be a pity were we compelled to lose the agency for the sake of upholding letter-perfect interpretations of law. The crying needs of agriculture should first appeal to the government, not taking into least account the harmful effect the withdrawal of the Kelly Springfield agency will have upon manufacturers of the United States with reference to Manila. We understand that Mr. Helvie is now negotiating for warehouse accommodations in Hongkong with a view to removing his machinery at an early date. We trust the government will put a stop to this proceeding before it reaches a point where reconsideration by Mr. Helvie will be impossible.

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PROBSTHAIN & CO., LONDON.—Messrs. Probsthain & Co., Oriental publishers and booksellers of 14 Bury-st, London (W. C.), inform us that they will issue immediately a new and revised edition of J. E. de Becker's *Nightless City* (Yokohama). This book is the most complete and reliable history of the so-called Flower Quarters of Japan, especially of the Yoshiwara. It will contain numerous and beautifully-colored plates, collotypes, and woodcuts, and the edition is strictly limited. (Price 30/- shillings).

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THE CRANE COMPANY, CHICAGO.—We are in receipt of the advance catalog circulars of this company which describe with numerous accompanying illustrations its machinery products.

ANOTHER YEAR'S PROGRESS IN THE MINERAL DEVELOPMENT OF THE PHILIPPINE ISLANDS

(Continued from page 267.)

LEPANTO-BONTOC.—In Lepanto, in the copper district of Mancayan, about 40 claims, including the Santa Barbara and Sin Nombre *pertenencias* of the Spanish *régime*, all now located under the present mining laws, have been reported as having been secured as an option by agents of a New York syndicate. The old Spanish workings have uncovered large bodies of high-grade copper ore on the Santa Barbara and Sin Nombre claims, and it is anticipated that much systematic exploration work will be done upon the adjoining properties upon the arrival of the syndicate engineer. In Suyoc, just S. of Mancayan, some important prospects are being developed by American miners at the present time. Gold and copper ores both occur here. Analyses at the government laboratories show four samples of Mancayan ores, collected by Mr. A. J. Eveland, geologist, Mining Bureau, to contain, respectively, 13.93, 16.5, 9.7, and 32.9 per cent in copper, and $4.75, $3.31, $1.65, and $0.85 to the ton in gold. The ores are "gray copper" ores, chiefly tetrahedrite, tennantite, enargite, and luzonite.

The Mancayan-Suyoc area was studied in 1904 by a field party from the Mining Bureau, consisting of Mr. A. J. Eveland, geologist in charge, Messrs Maurice Goodman and H. M. Ickis, field assistants, and field employees engaged for the work.

BENGUET.—In Benguet some important development work has been done, particularly in the District of Antimok. Here lie the claims of Messrs. M. A. Clarke, Petersen, Clyde, Lehlbach, Reavis, and others, most of whom have been at work here for several yrs. The ore bodies are apparently very extensive and it is known that much of the ore is of a good grade, varying through the district from $5 to $50 per ton in gold, the most important pay streaks being worked averaging over $12 per ton. Many samples from tunnels and crosscuts, however, indicate such constant low-grade values also that mine sampling in Benguet, as elsewhere, should be conducted with great care, and in accordance with most modern practice, in estimating values of ore in the mass. This is particularly advisable in view of the fact that similar samples, similarly taken in the same workings, show variations from $1.65 to $43 per ton, as in one vein, in which the pay streak gives the latter values and the next 4′ assayed only $1.65. This is an oxidized ore in a quartz gangue as far as uncovered. According to Mr. Lehlbach, who has persistently pushed development work, the vein systems of this district are closely related and are, above water level, largely of free milling ores. Messrs. Kelly, Clarke, Petersen, Reavis, and Clyde have done sufficient work upon their claims to prove deposits worthy of serious consideration and the amount of ore to be probably large. Mr. Clarke has received a 3-stamp quadruple-discharge Hendy mill and a 60-ton cyanide plant, all in charge of Mr. C. M. Eye, mining engineer. Messrs. Petersen and Clyde have built in Manila shops 3-stamp mill for development purposes, and reports indicate that they have had some satisfactory trial runs.

In the Bued River District Messrs. Hanson and Meade have uncovered a gold-copper lead upon which a 3-stamp mill will be erected at once. This mill is now being built in Manila shops and will be used for development and for trial runs. The ore is refractory and apparently a concentrating and shipping ore, and, as the "Copper King" claim, upon which it occurs, is near the Benguet Road and enjoys excellent transportation facilities, it is planned that trial shipments of concentrates to the Tacoma smelter be made. In this connection it may be stated that in response to requests made by this bureau for Philippine miners, the Tacoma smelter offers inviting terms to ore shippers here and has secured a rate per gross ton, f. o. b. Manila Bay, and delivered on smelter wharf at Tacoma, from the Boston Steamship Company, of $5 per ton.

In this district, also, Mr. Eveland reports that the ore outcrops on Mr. Petersen's "Gray Horse" claim are of lead, iron, copper, and zinc sulphides, carrying $20 to the ton in gold.

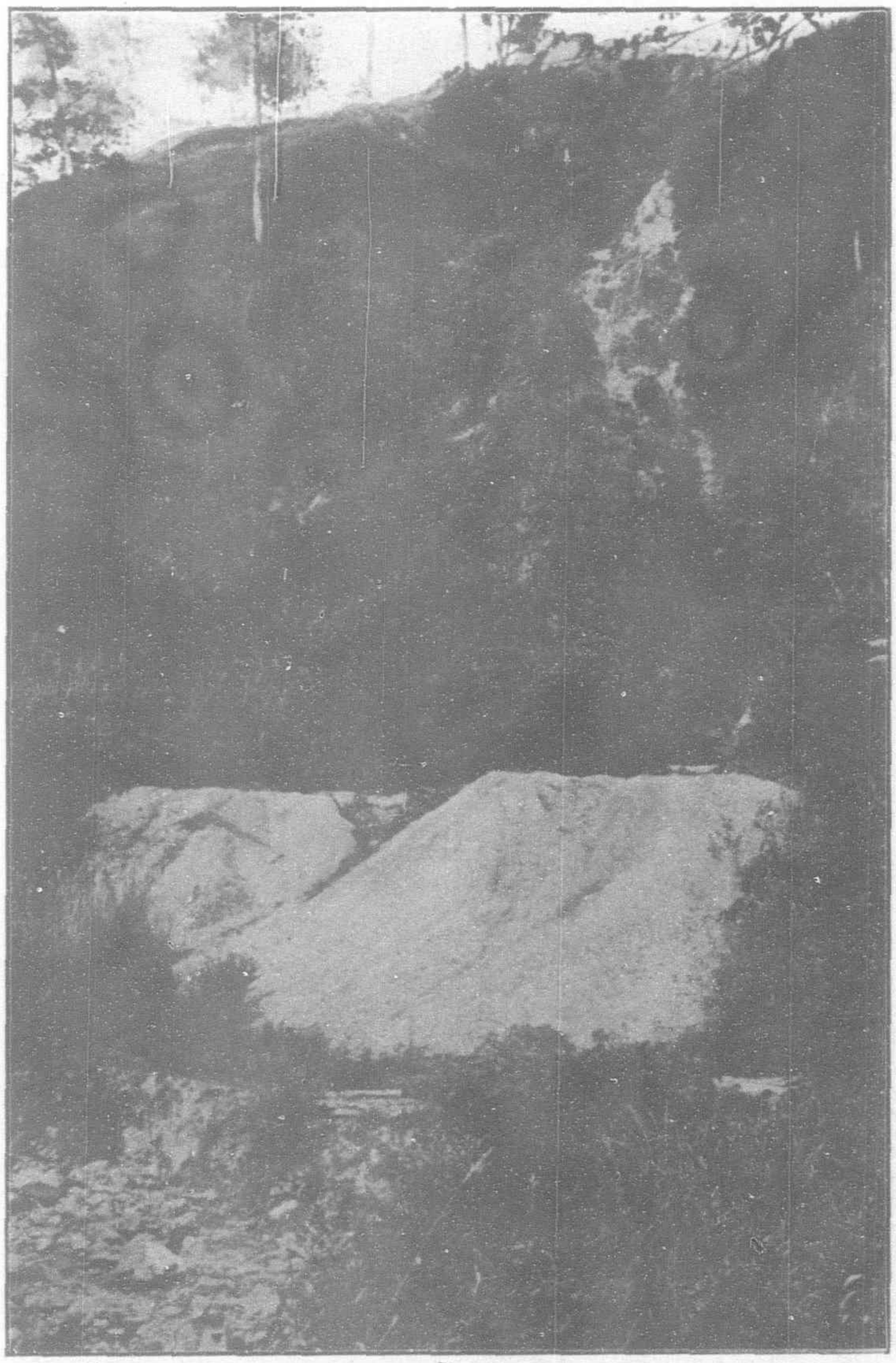
The 3-stamp mill that Mr. Hartwell built in Manila and operated at a profit on his "Hope" claim in Benguet has temporarily closed down, owing to the death during the yr. of the man who made it a success. Mr. Hartwell was a miner of the best type, conservative, competent, and combining within himself the sturdy qualities of the pioneer with the intrinsic



CLYDE'S CLAIM, ANTAMOK RIVER, BENGUET



HARTWELL'S CLAIMS, KIAS HILL, BENGUET



PETERSON AND CLYDE'S ORE DUMP, ANTAMOK RIVER, BENGUET.



NATIVE BLAST FURNACE, ANGAT IRON MINES, BULACAN, LUZON.

worth of high American citizenship. His loss is not only a loss to the mining industry here but to the large number of stanch friends he so readily made and kept. Mr. Hartwell was Kipling's "Explorer" personified, and whatever tribute may be found within those noble lines he richly deserves. He blazed the trail, explored the hills, found the gold, built the first American stamp mill in the Philippines, transported it to Benguet, worked his mine and mill and made them pay—all against constant obstacles that would mean failure to a man of less energy and grit. His reward was his successful struggle with difficulties that none but his kind can understand; his monument will be the gold-milling industry of Benguet.

PANGASINAN.—In Pangasinan in the foothills of the N. Zambales range, near Salasa, a number of claims have been recorded and worked. The ores here are copper carbonates and sulphides, assays of three samples from the claims of Mr. W. H. Miller, who is the pioneer in this field, showing respectively, 19.9, 11, and 18 per cent in copper, 13.2, 0.0, and 2 ozs. in silver, and $2.76, $1.60, and $3.80 in gold. These claims are favorably situated with respect to transportation by water and by rail, and if development proves these deposits extensive the prospects should seem good for profitable working.

NUEVA ECIJA.—In Nueva Ecija, near Gapan and Peñaranda, on the Rio Chico and elsewhere, extensive deposits of placer gold have been known for many yrs. No veins are yet reported, but prospecting in the placer ground is being actively prosecuted at the present time.

BULACAN.—In Bulacan, in the mountains E. of the towns of San Miguel and Angat, important deposits of rich hematite and magnetite iron ores have been known, and worked by natives in a small way, for over a century. Analyses of these ores have shown many of them to be very pure, and some of them fully up to Bessemer grade. Samples of them have been sent by the Mining Bureau to the steel works of Lewis & Hazlett, of Wheeling, W. Va., for analysis and report, and correspondence is now in progress with iron works of Japan looking to the profitable shipment of these ores. Analysis made by the government laboratories for the Mining Bureau gave the following results:

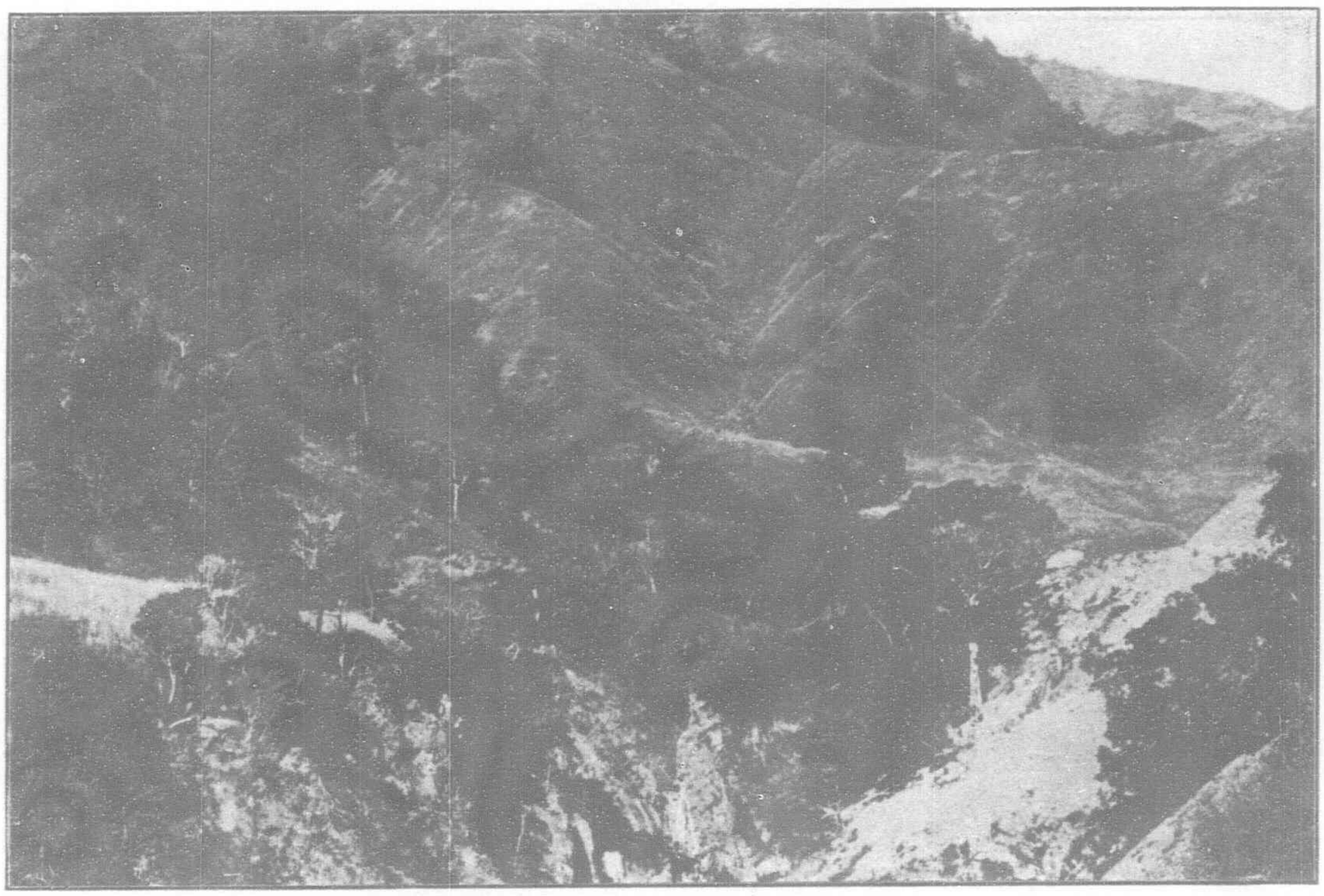
Bulacan iron ores.	No. 1, hematite.	No. 4, magnetite	No. 5 B, hematite.
	Per cent.	*Per cent.*	*Per cent.*
FeO	1.9	32 3	2.6
Fe2O3	88 2	48.7	84.2
CaO	.1	Trace.	.3
MgO	.2	1 3	.1
Al2O3	6.5	15.3	8.7
FeS2	.....	Trace.	Trace.
CO2	.....	Trace.	Trace.
H2O	.1	.1	.3
SiO2	2 2	2.2	3.8
P2O5	Trace.	.1	Trace.
TiO2	.8	.1	Trace.
Total	100	100.1	100

The natives of Bulacan have worked these iron ores in the open entirely and have smelted them in their small clay furnaces, with charcoal as fuel. No flux has ever been used, although vast quantities of limestone are at hand. Excellent gray iron castings have been made for plow points and shares, and the usefulness and economy of these deposits are apparently capable of far greater attention and profit than they receive at the present time.

RIZAL.—In Rizal Province placer washing for gold has been carried on by the natives for many yrs., and this has led American prospectors to the search for the origin of the gold in the hills. No important discoveries have as yet been made, however, other than the discovery of platinum, first identified in small amount by this bureau in placer sands from Rizal during the past yr. In Rizal Province, also in the vicinity of Bosoboso, there are coal and iron deposits which deserve more attention than they have yet had. At Binangonan occurs a limestone, fossilferous in part, which has recently been examined with reference to its use in the manufacture of Portland cement. An analysis of a sample of this limestone, collected by Mr. H. M. Ickis, field assistant, Mining Bureau, made by the government laboratories for this bureau, gave the following result:

Binangonan limestone.

	Per cent.
Water at 110°	0.16
Loss on ignition	43.15
SiO2	1.12
Al2O3	.08
Fe2O3	.07
FeO	.06
CaO	53.78
MgO	1.19
K2O	.28
Na2O	.49
Total	100.38
Specific gravity	3.29



BUED RIVER VALLEY AT CAMP IV, BENGUET.

This is at once seen to be an excellent material for the purpose of making cement; and there is available clay in the vicinity and good water transportation to Manila. Capitalists are now giving this proposition careful consideration with a view to erecting a modern rotary plant to cost not less than $225,000.

BATANGAS.—In Batangas Province work has been done in the Loboo Mountains upon 21 claims containing copper ores, two surface samples of which assayed, respectively, 2.71 and 17.1 per cent in copper, with a trace of gold in each, and a third showing 10 per cent in copper and $8 in gold. Later samples have given much lower results than those above.

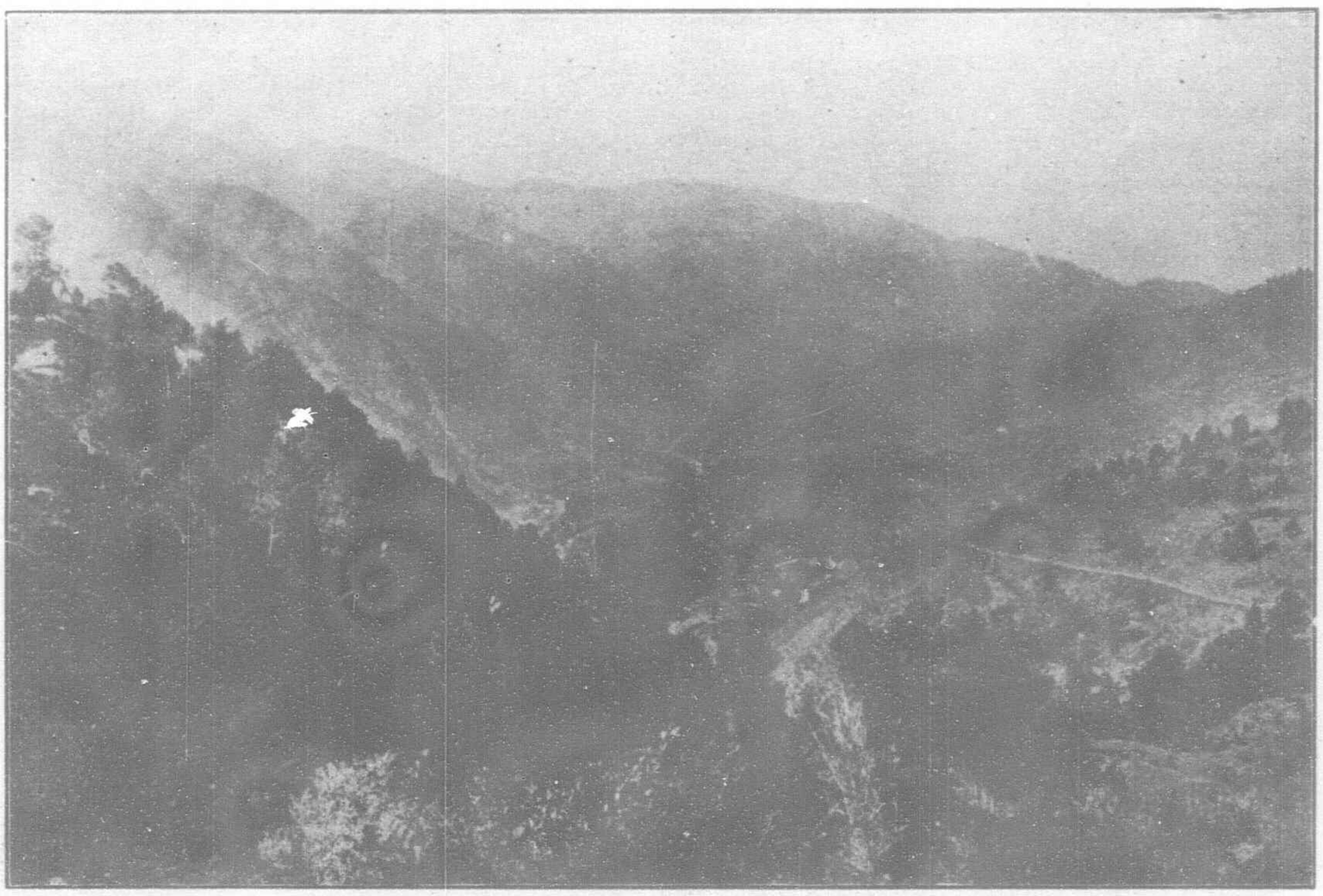
The veins are of two systems and of the fissure type, according to Mr. Smith, who has studied them, in dioritic rock (petrographically yet undetermined) and are from 6″ to 2′ wide, with an E.-W. strike for the major system and N. 45° to 57° W. for the second.

The principal minerals are bornite, chalcopyrite, tenorite, cuprite, chalcocite (?), malachite, and azurite. Traces of silver are carried by the copper, and one assay has shown the ore to carry $8 in gold to the ton. Molybdenite has been found scattered throughout some of the same veins in which copper occurs. The veins are principally of quartz, but porphyry and pegmatitic veins have been seen.

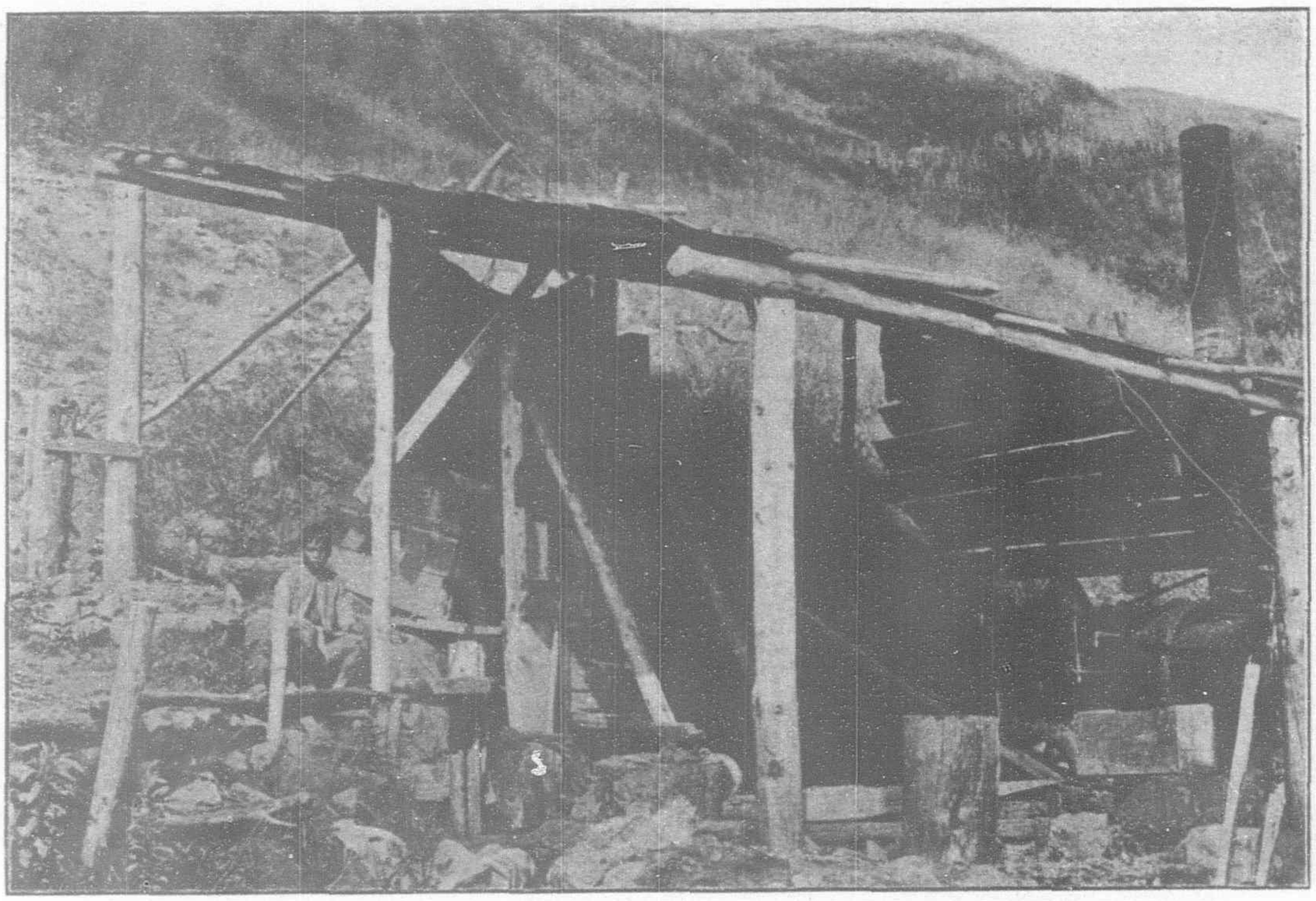
Up to the present time little more than assessment work has been done, but further development work will shortly be undertaken.

These properties are situated very advantageously for mining work, being about 600′ above sea level and not more than 5 ms. from a good harbor at Guinasepa on the E. coast of Batangas Province. Timber and water in abundance are available.

TAYABAS.—In Tayabas Province a large number of coal and petroleum claims have been recorded during the past yr., although it is not known that extensive development work has been done upon them. The Tayabas petroleum field lies on the E. side of the peninsula, on the Ragay Gulf. It has been reported that analyses of the petroleum have shown it to be of superior quality. No wells have yet been driven to thoroughly prospect this field, so far as known.



AGNO RIVER VALLEY AT BUGIAS, BENGUET.



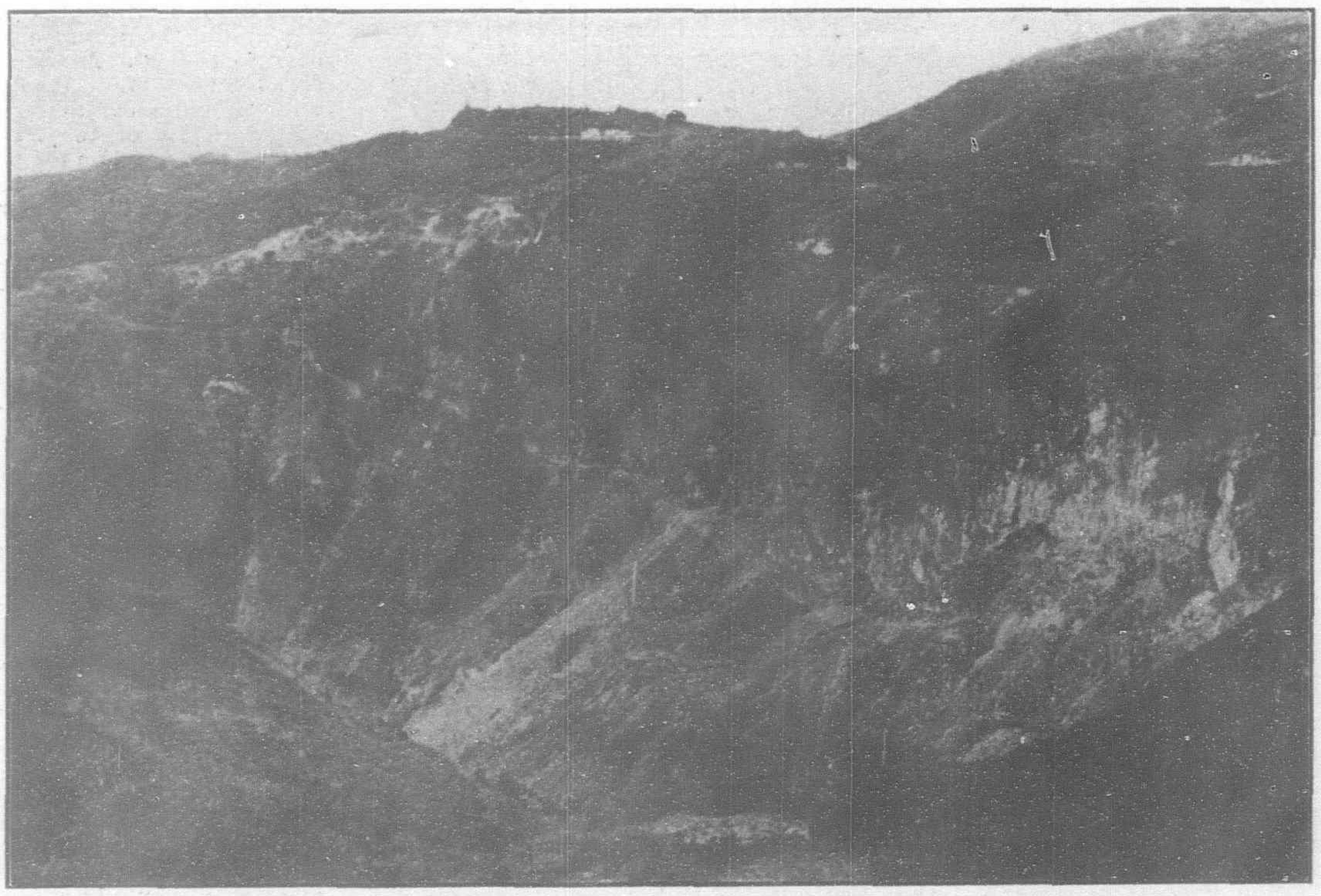
FIRST BENGUET GOLD MILL, HARTWELL'S MILL, KIAS HILL, BENGUET

POLILLO.—In the Island of Polillo, off the Pacific Coast, a large number of coal claims have recently been recorded. They cover a series of four seams, each apparently about 4′ thick, outcropping with an approximate N.-S. strike and a W. dip. The tonnage of available coal covered by the claims recorded is probably very great. No figures can be given, however, in advance of development work. There are no marked evidences of faulting or undue disturbance of strata, although folding undoubtedly occurs. Good harbor facilities are available and, upon the whole, these claims are considered worthy of serious consideration as affording a probable supply of workable steaming coal. Outcrop samples give the following analysis:

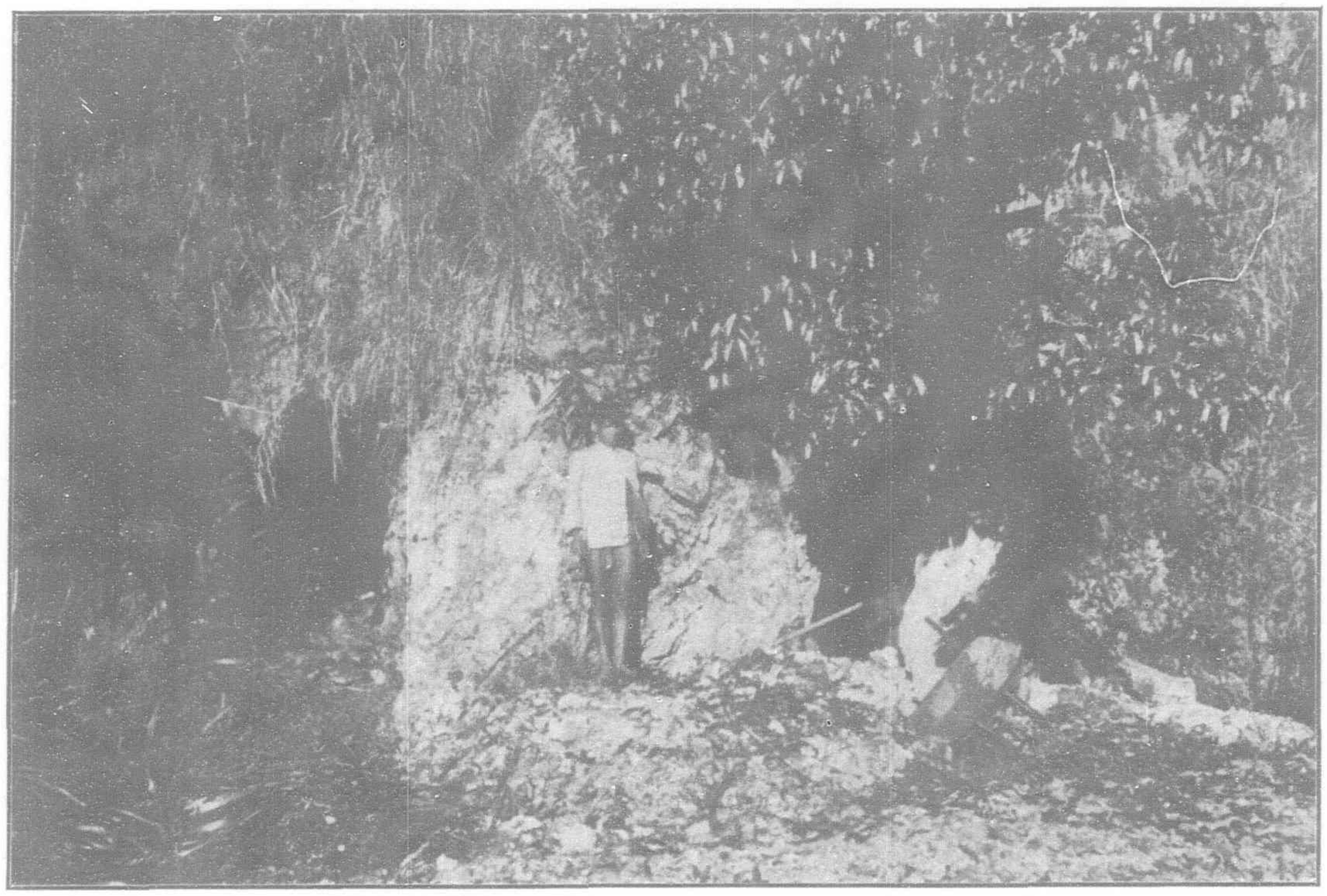
Polillo coal.

	Per cent.
Moisture	4.7
Volatile combustible matter	43.5
Fixed carbon	50.1
Ash	1.7
Sulphur	.28
Calorific value	6,897

AMBOS CAMARINES.—In the Camarines Province the Spanish concessions upon the extensive gold deposits in the districts of Paracale and Mambulao have been largely relocated by American mining men under present laws and without friction with the former concessionaires, and some work has been done in the reopening of abandoned shafts and in preparation for future systematic development. The important ore bodies of this district are reported to be contact deposits between crystalline schists and diorite, and to be well defined so far as uncovered. The contact is reported as traced for 20 ms., and along this all mining in this field has been done. Two vein systems intersect each other through the district approximately at right angles, the enrichment at some intersections having been reported upon as developing exceedingly high values. The strike of the most marked vein outcrops varies between 5° to 40° E. and the dip is reported to SE. The veins reported to be 1′ to 8′ wide and the vein filling to be quartz. Deep mining will probably involve pumping expenses of no mean consideration, but it is understood that much



COPPER DEPOSITS, MANCAYAN, LEPANTO, LUZON



OUTCROP OF KELLY'S NAPTUNG LODE, GOLD RIVER, BENGUET

valuable ore may be taken out before this expensive stage of mining is begun. It is fully believed that the deposits are worth the attention of competent mining engineers, retained by sufficient capital to work these mines; but, in the meantime, a preliminary step was taken this yr. in a careful study of this field by the detail of Mr. Eveland, geologist, to the work of a reconnoissance and the preparation of a general report upon the ore bodies themselves, and the further detail of Mr. Maurice Goodman, field assistant, to a careful survey of the placer fields of the Paracale and Malaquit Rivers. Reported assays from this district have averaged $20.92 in gold to the ton for the "San Mauricio," a representative group of claims covering deposits of partially refractory ore, and this for a large amount of systematic sampling reported by five different mining engineers. Assays of the "Tumbaga," a free-milling gold-quartz vein have given exceedingly rich returns, but as the sampling has been less carefully done upon this vein it would serve no good purpose to quote values here. The ores are described as sulphides of iron, copper, lead, and zinc, complex auriferous smelting ores in part and in part suitable for milling and cyanidation or chlorination. The placers have yielded important amounts of gold in the past, some of the nuggets being unusually large. While it may be somewhat doubtful whether sufficient rich placer ground remains for panning or sluicing methods, recent samples of gravel from the river beds indicate that dredger work here would pay. The average of 19 samples of gravel recently taken by Mr. Robert Lienau from the Malaquit River and examined by Mr. H. M. Ickis, field assistant, shows a value of 16 cts. to the cu. yd. It is anticipated that, notwithstanding mistakes that may have been made in the rather extensive development of the presumably rich ore deposits of this district in the past, the gold ores of Paracale and Mambulao, together with the placer fields, are most decidedly to be reckoned with in future work.

ALBAY.—In Albay Province, in Batan Island, Lieut. H. L. Wigmore, Corps of Engineers, United States Army, assisted by a detail of men, prosecuted an examination of the coal deposits for the military government by means of the diamond drill. Mr. W. D. Smith, geologist, Mining Bureau, was detailed to work out the economic geology of this area as his first work on the Philippines coal measures. The quality of the best Batan coals, which are classified by Mr. Smith as bituminous coals of Tertiary age, is shown by chemical analysis, calorific tests, and practical experimental use in boilers, to be excellent, and apparently fully suitable for steaming use. The quantity of the coal is believed also to be important, as are favorable local conditions for handling and shipping. Further and deeper borings should be made in Batan, however, before extensive mining is begun, to determine the continuity of the seams. Analyses by the government laboratories of some of these coals follow:

Batan coals.	No. 1.	No. 2.	No. 3.
	Per cent.	*Per cent.*	*Per cent.*
Moisture	6.62	9.54	6.08
Volatile combustible matter	38.68	41.56	40.36
Fixed carbon	54.42	44.86	51.24
Ash	1.28	4.05	2.32
Sulphur	.14	2.37	.40
Calorific value	. . . .	6,983	6,487

MASBATE.—In Masbate, in the N. part of the island near the town of Aroroy, more or less work has been done upon 60 or more claims, principally of free-milling gold ores in quartz, and upon 20 or more gold placer claims on the Lanan and Guinabatan Rivers. Manganese and iron ores of high grade have also been found here, but little attention has been given them up to the present time. Upon claims of the Eastern Mining Company, Mr. A. Heise has just erected a 5-stamp mill, purchased from the Union Iron Works of San Francisco, to handle the free-milling ores, and as a result of successive trial runs 11½ days, during which an estimated supply of 100 tons was crushed, fine bullion to the value of $954.67 is reported to have been obtained. This would indicate the value of the ore to average a saving of $9.55 to the ton. Upon the quartz claims of the Cogran Mining Company, on the Lanan River, a considerable amount of development work, showing most favorable indications of large quantities of free-milling ore, has been done. A series of parallel veins in granite and serpentine, the relations of which are yet undetermined, are reported here with a secondary system of intersecting veins. Upon the "Queen of Sheba" claim of this district there is an estimated dump of 2,500 tons of free-milling ore valued at from $8 to $42 per ton, the result partly of recent extensive open-cut work, and the sinking of an inclined shaft on the footwall, and partly of ancient workings carried on in a primitive way. An arrastra, driven by carabao power, has been successfully at work here for several mos. past, and the erection of a modern stamp mill will probably follow during the present year. Upon four claims of the Aroroy district a 10-stamp mill, originally intended for Benguet, and now in the Islands, will be installed at once by the Philippine Gold Mining, Power, and Development Company, according to plans recently announced. Upon the placer ground of the Philippine Mining Company on the Lanan River, a Risdon dredge, which represents modern and thorough workmanship in every detail, has been installed. This dredge handles 1,000 cu. yds. of gravel *per diem*, the gravel running, according to the estimates of Mr. Fred L. H. Kimball, consulting and managing mining engineer in charge, 25 cts. and over to the yd. As the dredge should work for a total cost of less than 9 cts. per yd. a good profit would seem to be in sight. Upon the placer claims of the Masbate and Oriental Mining Company, on the Guinabatan River, a similar Risdon dredge has been installed. The Aroroy and Lanan mining districts of Masbate have been in most energetic and progressive hands but have attracted less attention thus far than they deserve.

CEBU.—In Cebu but little more than prospecting has been done during the American *régime*. There are important deposits of steaming coal in this island and two known deposits of lead ores. An analysis of coal from the promising coal measures of Carmen, containing four seams reported to be, respectively, 14′, 13′, 9′, and 17′ thick, will give an idea of the purity of the best Cebu coals:

Coal from Carmen, Cebu.

	Per cent.
Moisture	5.
Volatile combustible matter	48.92
Fixed carbon	48.51
Ash	2.2
Sulphur	.37
Total	100

These bituminous coals are better than many American lignites mined, sold at a profit, and used with success upon railway and steamship lines in the United States, and they have been proved by practical tests in steamships in Philippine waters to do very well indeed. Furthermore, they should be put on the Manila market for $3.25 per ton and on the market at Cebu

for $2.50 per ton, as against Japanese coal at approximately $5 and Australian coal at $6 per ton.

MINDANAO.—In Mindanao some development work has been done by a little group of American miners at Placer, Surigao Province, but no late reports from this district are at hand. Some prospecting has also been done in Mindanao, and it is known that there is coal at Bislig and Sibuguey, and placer gold on the Agusan River and at Pigtao, near Misamis. This vast island is geologically yet unexplored.

ILOCOS NORTE.—Recent reliable reports are to the effect that asbestos has been found in quantity in Ilocos Norte; that metallic mercury has been found in Masbate, in the Camarines, in Zambales, and in Mindoro on the E. coast; that manganese deposits are cut by the Capas-O'Donnell rd.; that tin and tungsten have been found in NW. Negros, that infusorial earth occurs in Zambales and probably in Abra; and Mr. Smith has reported the discovery by him of molybdenite ores in veins in the Loboo Mountains of Batangas Province.

OTHER MINERAL DEPOSITS.—In addition to the above mineral deposits that have received some active attention or have just been reported or discovered, gold, platinum, copper, lead, zinc, manganese, iron, antimony, mercury, coal, sulphur, petroleum, salt, gypsum, limestone, clays, and building stones are known to occur in the Philippines as mentioned in the fifth annual report.

No more than investigation and development work have yet been done, and there are as yet no Philippine mines as the word "mine" is properly understood. In fact, there is little "ore in sight" in the sense that it is blocked out, but the indications are in many cases distinctly encouraging to more extensive work.

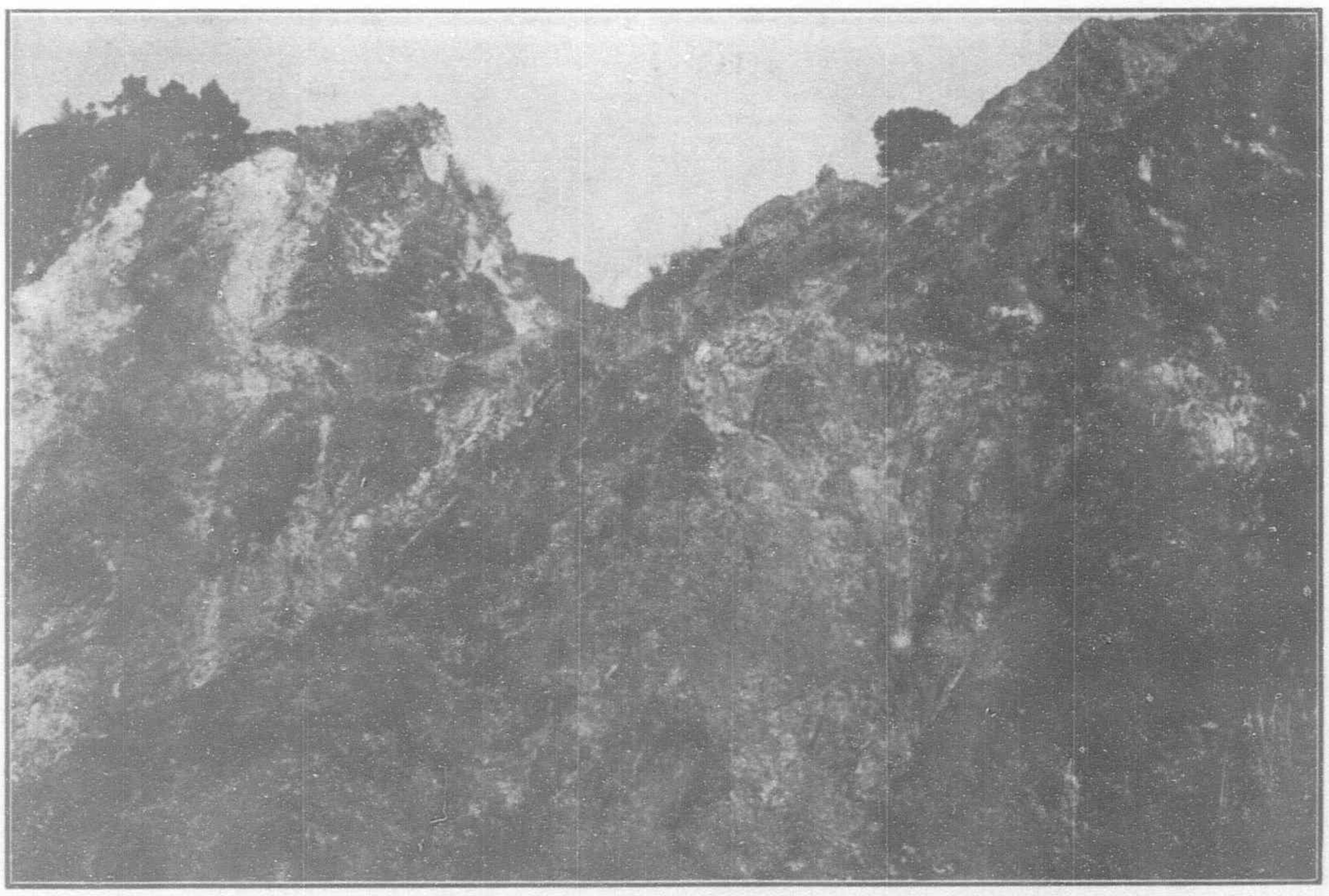
UNSATISFACTORY TRANSPORTATION. — Although the matter of transportation is not yet satisfactory and must necessarily remain a factor of great cost until the promised and prospective improvements of coastwise shipping and rates, of extensive railway construction, and, above all, of a greater mileage of good wagon roads of moderate grade, may have materialized, the labor problem has not yet interfered seriously with mining development nor is it expected to prove a factor of great uncertainty or cost. Mr. McCaskey's favorable views, expressed in the fifth annual report, concerning the possibility of developing sufficient and satisfactory mining labor in the Philippines, of Japanese and natives, or of natives alone, under competent white supervision, remain unchanged. He further believes this labor to be counted upon to afford mining at a comparatively low cost and therefore to render profitable comparatively low grade ores. Mining costs in the Philippines have so far been relatively low, and native labor has been almost exclusively employed. Mr. McCaskey is informed by Mr. Lehlbach, who has employed Japanese and native labor in Benguet, that he estimates that his total mining costs will be $0.70, his crushing, sorting, and tramming $0.24, and his milling and cyanidation $0.89, per ton, United States currency, on a basis of treating 4,000 tons of ore per mo., and the above costs to be reduced to $0.49, $0.17, and $0.59 per ton, respectively, on a basis of 15,000 tons per mo., this with native labor utilized under white foremen. These figures give totals of $1.84 and $1.25 per ton, respectively, but it is yet an open question whether costs so low can be maintained. Certainly they do not include pumping or hoisting from depth. In the Camarines Province it has been estimated that the total cost of mining, milling, concentrating, and management would be excessive at $5 per ton. In Masbate Mr. Heise reports that the total cost of mining, milling, fuel, and management, with native labor, has averaged $3.75½ per ton. The above are all gold-mining, stamp-milling, and development costs. In coal mining it has been estimated that at Carmen, in Cebu, the total cost of mining should not exceed $1 per ton. In Batan Island, according to Mr. Smith, with Japanese labor, total mining costs have been $2 to $2.50 per ton. Lieutenant Wigmore estimates, however, that with Japanese and native labor mixed, and working on a commercial scale, total mining and loading costs should not exceed $2 per ton. The above costs, it must be remembered, are during the pioneer stage of development and adjustment to new conditions; it is expected that they will be reduced in time, with the exception of Mr. Lehlbach's estimates. At least two mining men doing development work have stated that their preference is for native labor over Japanese, and the tendency is for the native to step into his proper place in Philippine mining and furnish the bulk of the labor required. It is not contended for a moment that native labor in general has been entirely satisfactory in the Philippines during the past few yrs., but it is contended very strongly that for this unfortunate condition of things, particularly with reference to agricultural labor, the laborer has been by no means entirely to blame; and with special reference to a relatively new field, such as mining, it is believed that with the absolute essentials of *(1)* fair treatment, including reasonable wages and prompt payment, and *(2)* competent supervision, a sufficient and satisfactory quality of native labor may be depended upon.

On the whole, therefore, the mineral industry of the Philippines has steadily grown. What its future may hold can not be safely prophesied now; but with the Islands at peace and under a safe and stable government, with no more of a labor problem than it is believed can be overcome, with increased transportation facilities in sight, with more confidence on the part of capital, and a better showing on the part of prospecting and development work, a conservative estimate would indicate a bright outlook for the year 1906. It is hoped and believed that the sturdy pioneers who have blazed the trail through many a heart-breaking day in fever swamp, jungle, and forest, during years of peril and privation, the full tale of which will never be told, will yet come into their own, and through them that the mineral industry of the Philippines will prove an important factor in the development of prosperity and progress under American rule.

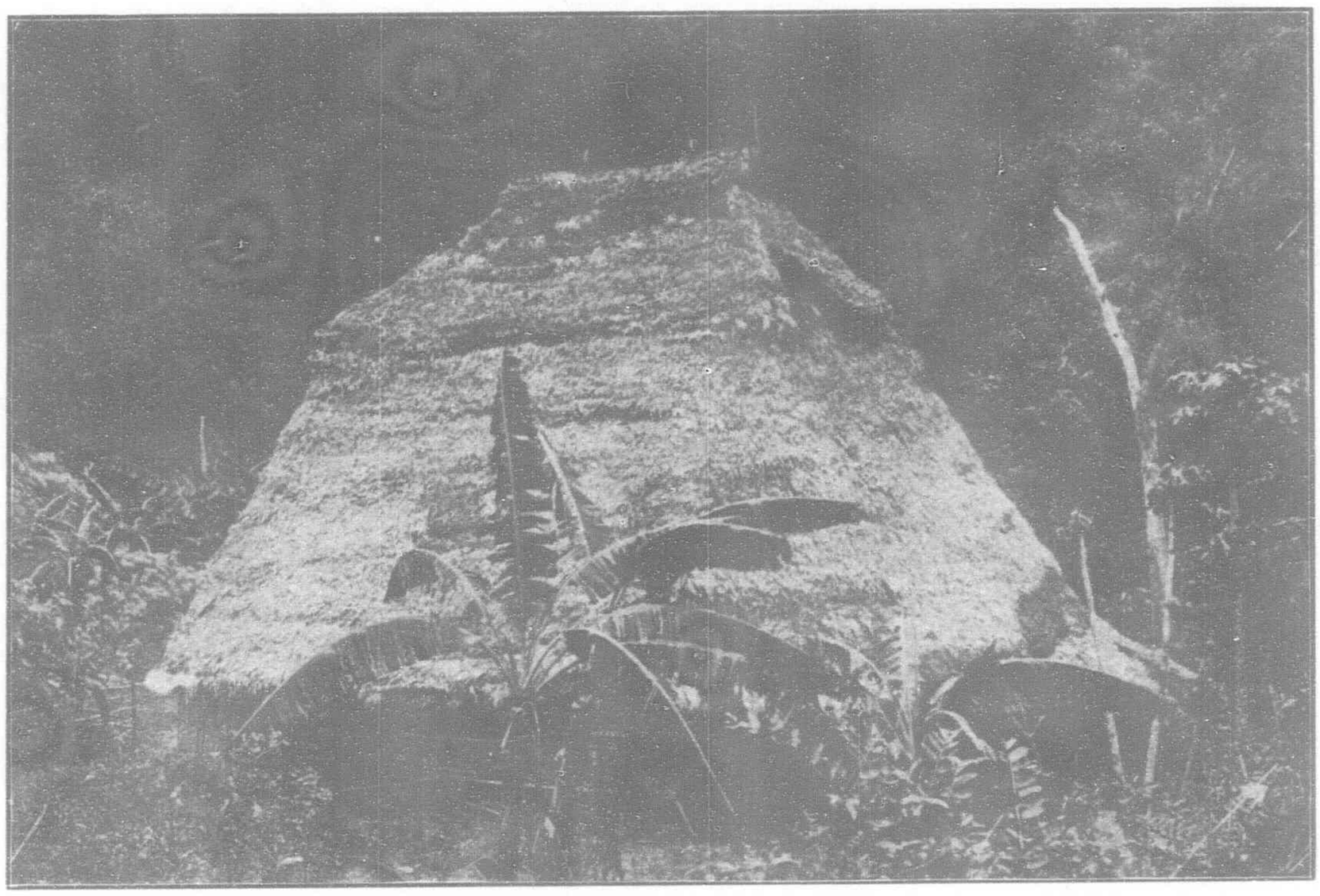
FINANCES OF THE BUREAU, FUTURE NEEDS.—For the expenses of the fiscal yr. just past the appropriations were ₱25,000 for salaries and wages and ₱6,100 for field and office expenses, a total of ₱31,100. Of this amount there were expended for salaries and wages ₱23,992.95, leaving a balance of ₱1,007.05, and for contingent expenses ₱5,988.30, leaving a balance of ₱111.70; the total balance to the credit of the Bureau for the year from unexpended funds is therefore ₱1,110.75.

For the present fiscal yr. the estimated amount required for salaries and wages is ₱28,261.04 and for field and office expenses ₱13,207, a total of ₱41,468.04.

The increase in salaries and wages estimated, of ₱3,261.04, is made up of difference in salary of one geologist at ₱4,000 between the entire yr. 1906 and a portion of the yr. 1905, and increases in salary recommended of one field assistant from ₱2,400 to ₱3,600, and of one chief clerk from ₱2,800 to ₱3,200, for part of the yr. 1906, upon completion of 2 yrs. of highly satisfactory service. The increase in contingent expenses estimated, of ₱7,107.00, is more than covered by estimated printing ex-



OLD NATIVE WORKINGS IN GOLD DEPOSITS OF SUYOC, LEPANTO



NATIVE SMELTER CAMARIN, ANGAT IRON MINES, BULACAN, LUZON

penses for four publications of this bureau and for forms, blank books, letter heads, etc., not estimated or provided for in 1905, amounting to ₱7,000; of postage and telegraphic expenses, in lieu of the free service of the past and therefore not estimated or provided for in 1905, amounting to ₱2,540, and of an increase of ₱400 in field expenses for the more extensive work of this yr.; in all, amounting to an apparent increase in contingent expenses of ₱9,940, of which ₱9,540 is an estimate due to required estimates for expenses not charged against this Bureau last yr. thus showing a relative *decrease* in contingent appropriations of ₱2,833 for the fiscal yr. 1906, or a relative total increase of all appropriations over last yr. of but ₱828.04 for the present fiscal yr.

The just promotion of two especially loyal and efficient members of the bureau staff, the necessity for the increased field work possible with the completely reorganized bureau, and the demand for reliable published information upon the mineral resources of these Islands, it is believed, will fully justify the necessary increase of appropriations required.

GREEN ISLAND CEMENT COMPANY, LTD., HONGKONG

The 17th ordinary general meeting of the shareholders of this company was held Saturday, February 24th, at the office of Messrs. Shewan, Tomes & Co., general managers, in Hongkong. The Hon. Mr. Shewan presided. The chairman said:—

GENTLEMEN:—The report and accounts for 1905 were issued on the 9th inst., and we will therefore, with your permission, take them as read now. As we anticipated at last yr.'s meeting we have done still better than before, and the accounts show a gross profit on working of $498,834 as against $444,094 last yr., the net amount available for appropriation, after deducting interest and sundry charges and allowing for depreciation, being $437,219.87. Out of this we propose to place $10,000 to reserve fund, and pay a dividend of $2 per share and a bonus dividend of 50 cts., absorbing $375,000 leaving $52,219.87 to be carried forward to the credit of next yr.'s account. As it was represented to us by influential shareholders that a larger dividend than that of last yr., *viz.* $2, was expected, and as we are anxious to meet the views of shareholders though at the same time we are averse to increasing the usual rate of dividend until we feel more confident of maintaining it at the increased figure, we recommend an extra bonus dividend of 50 cts. per share on this occasion, which we hope will be approved by all shareholders. As good provision has been made for depreciation, and as the reserve fund is invested in the business of the company itself, and is not a reserve in the true sense of the word, we recommend placing only $10,000 to the credit of that fund, which will then amount to $910,000.

Throughout the yr. the demand for our cement was very good, and we had no difficulty in disposing of all we turned out. The full benefit of our new rotary kilns was not however received, as after their installation much time was necessarily consumed in training our workmen, and accustoming them to the new condition of things. I am pleased to say that these kilns now promise to exceed our highest anticipations.

So much for the profit and loss account. Referring to the balance sheet you will have no doubt noticed the large stocks principally of raw material that we are carrying. I can only assure you that this is absolutely necessary. Your general managers lay great stress on the advisability of keeping these stocks, and would make them even larger if possible, as with our continually increasing output, even now, they are by no means large in proportion to the consumption. They are all valued at actual cost, and no credit has been taken for any profit on manufactured cement. As you will see from the figures a great deal of money is tied up in these stocks, and so, in spite of the last increase of capital, we still owe $250,000 to our bankers. The other items in the balance-sheet are comparatively trifling, and I do not think require any explanation.

I now come to another point which has been raised. We have been urged by some of our largest shareholders to pay an interim dividend half-yearly, but it seems to us that it would be hardly right to do this so long as we have to go to our bankers for the money. The payment of this dividend will increase the present overdraft considerably, so if we are to wait for interim dividends until we have funds in hand we may have to wait some time. The only way we can meet the wishes of these shareholders is to raise more capital, and it is proposed that we should issue a further 50,000 shares at par, which will bring in $500,000 and raise the capital to $2,000,000. We cannot expect to always run on borrowed money, and $2,000,000 is not a large capital for the business we are doing. On the contrary, you must not run away with the idea that such works as ours could be built with a capital of even $2,000,000, for to that you must add $800,000 of original capital written off and the $900,000 at reserve, which is really capital. So that to duplicate factories such as ours to-day would take at least $4,000,000, if not more, and yrs. of experience into the bargain to run the business. Of course, this proposed increase of capital must be dealt with at a special meeting, of which due notice will be given, and it will be then for shareholders to decide whether they are in favor of it or not. We might have followed the previous course, and issued the shares at a premium, but shareholders appeared to be opposed to this, and as the 5 *lacs* seems to be about all we shall need we recommend leaving the shares at par. The new shares will, of course, rank equally with the old shares for dividend, and to save time and trouble to all concerned it is proposed to make one call only of $10, due on 31st July next.

As regards the future it is impossible to make a forecast; the brightest feature in our favor is that the use of Portland cement (for you must not forget that ours is true Portland cement) has increased, and is increasing all over the world. Coal, too, which has been very high during the yr., has fallen somewhat in price; but, on the other hand, the present high rate of exchange is against us, and then, too, our two best and largest local contracts are rapidly running out. However, railways in China have brought us some business, and will, we hope, bring us a good deal more. There is nothing more that occurs to me as useful to add except that I should like to put on record your general managers' appreciation of the loyal and hearty support they have received from the manager, Mr. Uldall, his deputy Mr. Hewitt, and all the staff at both factories in a very busy year.

Mr. Michael, referring to the increase of capital, asked if, instead of issuing new shares at $10 and paying 20 per cent dividend on them, it would not be better to borrow money at 6 per cent and give the shareholders the benefit of the difference.

The Chairman: It would be better if you could depend on getting money at 6 per cent.

Mr. Michael: Every company in Hongkong is getting it at that.

No other questions being asked the Chairman proposed the adoption of the report and accounts.

Sir Paul Chater seconded.

Carried.

Mr. Parlane moved the re-election of Sir Paul Chater, Hon. Mr. C. W. Dickson and Dr. J. W. Noble to the consulting committee.

Mr. Carmichael seconded.

Carried.

Captain Clarke proposed, and Mr. Moses seconded, the re-election of Messrs. T. Arnold and W. H. Potts as auditors.

Carried.

The Chairman: That is all the business, gentlemen. Thank you for your attendance. Dividend warrants are ready now.

NEW AMOY DOCK COMPANY, LTD.

This company's working account for 1905 shows a profit of $22,506 62. Deducting the debit balance from 1904 amounting to $10,260 77 the total profit was $12,245 85 To this is added the premium on an issue of 4,000 new shares amounting to $10,000, making a full total of $ 2,245 85, which amount it was proposed at the recent annual meeting of the company to deal with as follows: Transfer to reserve fund $32,500; write off plant and machinery $3,910.19; write off material, $5,589 81; commission and fees to manager, $1,224.58; general manager and consulting committee, $800; dividend of $1 per share on old issue $6.000; dividend of 50 cts per share on new issue, $2,000; carry forward, $2,221 27. The reserve fund now stands at the substantial figure of $88 000. The new issue was all taken up and all shares will from now on rank same for dividend. During the 1st half of the yr. work was scarce, but the latter half the dock was well employed and there is every reason to look for good and profitable work in the future. Mr. R. H. Bruce resigned as general manager on leaving port, and Mr F. B. Marshall was invited to fill the post. The retiring directors, Messrs A. F. Gardner and W. Kruse have been reelected.

ARGUMENT BY MR. REA AT WASHINGTON (D. C.) FOR TARIFF REDUCTION ON PHILIPPINE SUGAR

[Before the Ways and Means Committee of the lower house of Congress, having under consideration the "Payne" Bill.]

The CHAIRMAN. Gentlemen, we will now hear Mr. Rea.

Mr. Rea, please give your name to the stenographer.

Mr. REA. My name is George Bronson Rea.

The CHAIRMAN. How long have you resided in the Philippines?

Mr. REA. Two yrs.

The CHAIRMAN. And before that where did you reside?

Mr. REA. Thirteen yrs. in Cuba as a sugar engineer and manager of an estate.

The CHAIRMAN. Were you engaged in the sugar business in Cuba?

Mr. REA. Yes.

The CHAIRMAN. In what capacity?

Mr. REA. In all capacities, from engineer up to manager of the estate. I was also representative of one of the largest sugar machinery houses in New York.

The CHAIRMAN. Go on and make your statement.

Mr. DALZELL. Before you go ahead, let me ask what business are you in at Manila?

Mr. REA. At present I am engaged in publishing an industrial and trade paper, called THE FAR EASTERN REVIEW. It has a wide circulation all through the Orient. I am making a study of trade questions there. I went over there to go into the sugar business primarily, but conditions were not favorable, and instead I went into the newspaper business.

The CHAIRMAN. Go ahead.

Mr. REA. I want to be very brief in presentiug this statement, and dwell upon one or two points which the opposition has pointed out strongly against us—the possible low cost of production in the Islands and the effect it might have on home industries later on.

In placing before your consideration my reasons and arguments why the Philippines should be conceded the benefits of a reduction in the tariff as embodied in the Payne Bill, I want first to take up and analyze the statements and opinions so glibly presented in opposition by our friends Major [Aaron] Gove* and Mr. (F. R.) Hathaway.†

The trend of their argument, if their private opinion may be dignified with that expression, is to the effect that the conditions in the Philippines as to labor, soil, production, and yield are such that, if permitted to develop, they will ultimately swamp not only the American beet-sugar industry, but also the cane-sugar industry of Louisiana, Hawaii, and Porto Rico, and seriously handicap the industry in foreign countries.

These gentlemen have appeared before this committee, after a brief trip through the Islands, and posed as authorities on a subject which has been the bane of congressional legislation for several yrs.

In a matter which so seriously affects the industrial development of the Islands and the future of our insular possessions, it is only fair to presume that persons appearing before this committee should be qualified by experience to vent their views and opinions, especially where absolute data are lacking and where we have to rely on personal deductions.

Major Gove, one of the so-called experts who has regaled the committee with his views on the Philippines, was sent out to the Islands to find out the truth about the situation. Now, it appears that Mr. Gove is a school teacher, a professor, or in some way connected with the educational department of his state, and has a fair knowledge of raising beets; yet without any previous training or knowledge of the cane sugar industry he departs for the other side of the world to find out the truth about something he does not understand—something which has puzzled experts for the last 10 yrs.

Mr. Gove, in his lack of knowledge concerning tropical agricultural conditions—you will remember that he wouldn't recognize a tobacco plant if he saw one—was distinctly handicapped when he set out on his journey, and doubly handicapped after his arrival by his ignorance of the language, which forced him to rely entirely on the garbled statements of native interpreters, who probably didn't know what he was talking about, anyhow. Yet the gentleman traveled around the Islands, gathering ideas, information, etc., on which to base a conclusion. He was forced, through his ignorance of the industry, to accept whatever was told him, and this same inexperience prevented him from delving into and analyzing the things which he heard.

Yet Mr. Gove formed an opinion, and he comes before this committee to unbosom himself of the great discovery that the Philippines can produce sugar cheaper than any other place in the world, and if this bill passes they will produce it cheaper yet and swamp our home market.

Mr. Gove could not for the life of him get up here and explain by actual figures how this can be done, yet he takes up the time of the committee by telling it in so many words that he thinks it can be done. Not one single detail of cost has he put forward on which to base his deduction so that he can prove his assertions, yet he comes here as an authority and endeavors to sway this committee against the proposed bill.

We find in his companion, Mr. Hathaway, a gentleman of the same type. Mr. Hathaway, however, tells us that he went there in the guise of a promoter, to obtain options on lands, etc., and gather data for others who intended to start a sugar factory if his reports were favorable.

Now, do not mistake me in that I doubt the veracity of Mr. Hathaway's statement in regard to this, but it is fair to say that it is highly improbable that his mission was a serious one, for again we find that Mr. Hathaway is a beet-sugar man with no previous knowledge of tropical cane-sugar conditions, and whose opinion or report before a body of capitalists would be considered worthless. It is logical to presume that when capitalists seriously contemplate investing anything like a half to a million dollars in an industrial enterprise, especially on the other side of the world where they have to rely on expert reports, they will pick out a man who thoroughly understands that particular line of business. When the sugar people on lower Wall st. want information about cane lands and the prospects of making an enterprise pay they don't select and send out a beet-sugar man, but look for the best cane-sugar expert available. Neither do they give a cane-sugar man a commission to investigate lands and conditions in the beet districts. They get a beet expert to handle this matter.

Now, Mr. Hathaway also operated under the same handicaps as Mr. Gove, but with the further disadvantage that he represented himself as wanting to invest in sugar lands and erect a large factory. Now, you can imagine the kind of information he obtained from a bunch of planters, loaded down with debt and worked-out lands, all anxious to get in on the band wagon. [Laughter.] You can bet that human nature in the Philippines is exactly the same as it is here, only a little more so in that one particular; and lands that would grow 1 ton of sugar suddenly increased in fertility, without the application of irrigation and fertilization, to 3 and 4 tons, and prices of lands rose in proportion. Mr. Hathaway just reveled in the kind of data he was looking for, and swallowed it all. As some at the planters told me afterwards, he looked such an easy mark that we *tomo el pelo*, or, in the English, "We took his scalp."

Now, if Mr. Hathaway knew anything about the cane-sugar business he could by simple observations have sized up conditions and seen when the statements were exaggerated. If he ever had any extended experience on a cane-sugar plantation he could, by riding round a cane field, arrive at a fair estimate of the tonnage; and similar knowledge of the mechanical equiment of the sugar house would enable him to know just how much sugar could be extracted. But Mr. Hathaway in his apparent ignorance of the most rudimentary facts about cane-sugar accepted the statements rendered him, and was unable to analyze or digest them after he absorbed them.

Yet Mr. Hathaway also comes before the committee and says in effect the same as Major Gove. This may be called expert testimony, but, gentlemen, it would never be accepted by a body of business men as a basis for an investment. On its face it is absolutely worthless, and, taken together, the entire statements are the finest exhibition and collection of hot air that I have ever seen published.

We are not going into details in what I say, gentlemen, but we will take the general outlines. We are all tired of statistics.

They state, in effect, that sugar can be produced from 1c. per lb. down—the cheapest production the world has ever seen. Now, when we make a definite statement of cost, that cost is open to analysis, for it is made up of many items. To make such a statement one ought to be able to prove it by figures. There are many minor details which go toward making that cent or less, such as plowing, harrowing, drilling, planting, cultivating, cutting, seeding, hauling, milling, boiling, and other items; and when the assertion is made that sugar can be produced at a cost of a cent downward it requires elaboration.

Now, I may state for the benefit of the committee that I spent over a mo. in Pampanga and Negros devoting my time to ascertaining the cost of a picul of sugar, by following each stage of the work from the time the plow was put in the ground to the time the sugar was handed to the local market, and my investigations bear out the statements, presented by Mr. De la Rama and others, that the average cost price, without including interest, loss of cattle, depreciation, etc., is about $4 per picul, or, roughly, 1½ cts. per lb., or, including everything, about 2¼ cts.

The CHAIRMAN. Is that without any depreciation?

Mr. REA. Yes; without including that.

The CHAIRMAN. Sugar delivered where?

Mr. REA. In Manila, from Pampanga. It is the bare mill and field cost, delivered either at Manila or Iloilo. It is about the same thing from either place.

Now, when persons who admittedly know little or nothing about the conditions in the Islands, except by hearsay, coupled to their inexperience with the industry, endeavor to inflict their private views before a committee of this standing, and in contradiction to the statements of those who should know what they are talking about, it is surely permissible to request that they submit an itemized statement of cost, bearing out their views, so that we can see whether they are right or not.

Now, I am intensely interested in this subject myself, and am desirous of finding out just how this low cost is arrived at. It must be remembered that the movements of all farm laborers, especially those employed in plowing, cultivating hauling, etc., are regulated entirely by the sweet will of the frisky and swift-moving carabao. The carabao sets the pace, and when we stop to think about the time necessary to plow a field we can not calculate on harnessing up several horses and mules to a big disk plow, but have to take as our basis the pace of the carabao and his one little 6-in. plow; and if we add two or more carabao with the hope of making them go faster, they refuse to work together. [Laughter.]

Some of the gentlemen comprising the committee have seen the carabao on his native

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* Representing the beet-sugar interests of Colorado, against tariff reduction.

† Representing the beet-sugar interests of Michigan, against tariff reduction.

heath and admired the celerity of his movements. [Laughter.] People wonder why the Filipino is slow in movement, especially the countryman. If I may venture an opinion, I think that the natural development of centuries of following the carabao has something to do with the movements of the natives.

I think that for the full information of this committee our friends should be called upon to produce their figures on which they base this low cost of production. If it is permissible, I would like to have these figures now, as the gentlemen are present and must have them about their persons somewhere. If the honorable chairman will call for these figures, I wlll conclusively prove to the satisfaction of this committee that neither of the gentlemen referred to knows what he is talking about; or if they will take the standard wage of 20 cts. per day and a yield of 1 ton to the acre and bring that cost down to less than a cent, I stand ready to hand them over $100 for the information. If it is permissible before the committee, I would like to have the facts known. But they can not produce them, anyway. Neither Mr. Hathaway nor Mr. Gove can stand up and give you an itemized answer as to the cost of a picul of sugar. I would like to have that information now. I will give them $100 for it. It is worth that to me for an article. I can use that for my paper, and would be glad to pay it, so as to show the Philippine planters just how they can do it.

Mr. HATHAWAY. You will get it.

Mr. REA. And you will get the money, too.

Mr. HATHAWAY. I need it.

Mr. REA. But it must be made up of real figures, based on an actual calculation.

Now, gentlemen, it has been repeatedly asserted, though no definite figures have been placed in evidence that if this bill is passed capital will be forthcoming, and under modern methods of cultivation and manufacturing the industry in the Islands, like the pipe dreams of Colonel Sellers, will develop to such an extent and so rapidly that in about 2 yrs. we will produce 10,000,000 tons of sugar. The production of the lands will quadruple, the rattoon crops will live forever, and the yield from the mill will be so great and the cost of production so low that the profits will be enormous. The bill, like Aladdin's lamp, will be sufficient for everything.

Now, in all the comparisons of the tropical cane-sugar industry made by the opposition great care has been maintained to take the most favorable phase of the industry in Cuba and Hawaii to show what can be accomplished in the Philippines. The following is a sample of this nature. It is a short quotation from my paper, THE FAR EASTERN REVIEW, which I have cut out [reading]:

PHILIPPINE SUGAR INDUSTRY.—In the senate debate on the Cooper bill of December 16, Senator Dubois, of Idaho, a champion of the beet-sugar trust, made the following biased remarks:

"There are in the Philippine Islands some 72,000,000 acres of land, only 5,000,000 acres of which are in the possession of individuals or corporations. The other 67,000,000 acres are public lands, and, as a general thing, they are exceedingly rich for agricultural purposes. Some 50,000,000 acres of land in the Philippine Islands are susceptible to the highest cultivation, and this is especially so in regard to sugar. In Louisiana, in Texas, and in other favored spots of this country they have raised from 1 ton to 1½ tons of cane sugar to the acre; in certain other favored portions of our country they raise from 1 ton to 1½ tons of beet sugar to the acre; in Cuba they raise about 4 tons to the acre; in Porto Rico, about 4½ tons; in the Hawaiian Islands, 4 to 4½ tons, and on some plantations in Hawaii they raise as high as 10 or 11 tons to the acre, and the Philippine Islands are more productive for sugar than the Hawaiian Islands."

Mr. DALZELL. When were those remarks made?

Mr. REA. They were made on the 16th of December last yr.

Mr. DALZELL. In 1904?

Mr. REA. Yes. This was taken from the Congressional Record. (Continuing:)

This is an excellent example of the tactics of the opposition, showing, as it does, the unwarrantable exaggeration of everything connected with the tropical cane-sugar industry and conveying a false idea of the possibilities of the Philippine yield. Broad, unqualified statements of this nature operate against us and are taken for gospel truth by the uninitiated.

The main points in the statement are fairly correct, although the figures are stretched to the fullest yield under the most favorable conditions and can not be accepted as normal or average. It is, however, the unfair comparison of the closing words of the paragraph to which objection must be taken. All tropical sugar lands under natural conditions—that is, without the aid of scientific fertilizing, cultivation, or irrigation—will produce an average of 2 tons of sugar to the acre, or rather 20 tons of cane. The best virgin lands will run about 4 to 4½ tons for the first 2 yrs., and then dwindle down to 1½ to 2 tons. It is true that on some estates in Hawaii 10 to 12 tons of sugar are produced from an acre of cane, but to state immediately afterwards, without any qualifying remark, that the Philippine Islands are more productive than Hawaii demonstrates a dense ignorance of the subject-matter or a willful attempt to distort the facts in favor of the beet-sugar industry.

The Hawaiian plantations producing 10 tons to the acre are very few, and to secure this phenomenal yield the most modern scientific methods are employed from the time the cane is planted until the sugar is turned out of the centrifugals bagged for market. Fertilizing on a large scale is necessary, and the most elaborate and costly systems of irrigation are employed. It is a mooted question whether the increased yield compensates for the enormous capital outlay and operating expenses incurred. The irrigating plants alone are valued at more than the immense mill plants and cost more to operate in proportion to the power used. We have in mind a contract for the erection of a Hawaiian sugar house where the mill plant cost $450,000 and the pumping plants for the required acreage $550,000.

I just wanted to show the exaggeration of that statement, because all the arguments seem to be built on such air castles as those comparing our yield in the Philippines with the most phenomenal artificial yield in the world.

The CHAIRMAN. I understand that the yield at the Ewa plantation in Hawaii was between 11 and 12 tons to the acre.

Mr. REA. Yes; that is the Ewa plantation. But it is operated at such an enormous cost that one of the stockholders told me, "We don't know, Mr. Rea, whether it is profitable for us to continue along those lines or not." (Continuing:)

The Hawaiian plantation depending for its water upon the natural rainfall will yield the average of 2 to 2½ tons of sugar per acre. To state that the Philippines are more productive than Hawaii, in comparison with the yield of 10 to 11 tons, is grossly incorrect, and even when we take the normal average under natural conditions of 2 tons to the acre, we are confident that the Philippines can not pass much beyond it except on virgin soils, and by virgin soils we mean cleared forests and not the grassy bottom lands.

Granted that the islands can produce 2 tons of sugar to the acre. To secure this yield the most modern machinery and mills must be employed. At present not 2 tons are produced.

This constant struggle of the home sugar industry to preserve the home market for its own tardy development appears to us somewhat like the little boy whose eyes were bigger than his stomach. It is a commercial impossibility for the beet industry to keep pace with the increase in consumption, let alone trying to hog the whole market. For several years we have heard the crying and yelling of the infant above all other sounds in the national legislative chamber. "Protect us from the bugaboo man in the Philippines!" has been the constant cry. "We can supply all the sugar needed for the home consumption if you will only put a high fence around the little brown ogre, so he can't eat us up." And the baby has been petted and given its sugar pap, and has clapped its hands and goo-gooed in glee. But it has not made good.

Although the consumption of sugar in the United States increased over 500,000 tons in the 5 yrs. from 1898 to 1902, the baby only contributed 100,000 tons to the increase. In 1900 the consumption increased nearly 90,000 tons over the preceding yrs. The "kid" contributed with 20,000 tons. The consumption nearly doubled in 12 yrs, from 1890 to 1902, or to be more exact, it jumped from 1,476,377 tons to 2,566,108, and the demand is steadily increasing. Of the latter figure only about 500,000 tons were produced in the United States; the balance imported.

To return to the question. I ask you, gentlemen, is it fair to compare the Philippines with countries lying on the other side of the world, and ignoring the differences in race, climate, and location? Because 10 to 12 tons can be produced by artificial stimulation in Hawaii, is it fair to assume that it can be done in the Islands? Is it not a fact that only in a few places in Hawaii is this extraordinary result obtained, and is it not clearly apparent that it is due entirely to purely local conditions of soil and climate? If not, would not the same yield be secured in other parts of the same islands?

Is it not a fact that under normal conditions in Hawaii, without the aid of fertilization or irrigation, the yield per acre is about the same as it is in other tropical cane-sugar countries? To assume that the same climate and soil conditions exist in the Philippines as will yield 12 tons of sugar per acre, without the slightest attempt at experiment or investigation, and to stand up here in our national legislative halls and pronounce it a fact, is, in my mind, the limit.

I know that some of you will say that the climatic conditions must be the same, as the islands are just under the Tropics, the same as Hawaii and Cuba. But it don't follow, just the same. Why is it that hemp will grow only in the Philippines, despite the many attempts to force its growth in other nearby islands? Soil conditions can be chemically corrected by modern scientists, so that it can't be attributed to that cause, and we are left with the only logical explanation that the climatic conditions in the Philippines are peculiar to themselves.

The CHAIRMAN. That is the only place in the world where hemp will grow, that kind of hemp, the abaca?

Mr. REA. Yes.

Can our friends explain why it is that ordinary lands in Cuba will grow six rattoon crops and new virgin lands fifteen, while in the adjoining island of Porto Rico they only secure two rattoon crops and a lower tonnage per acre? Or why is it that in Hawaii, with all modern aids to cultivation, they can secure only two volunteer crops?

Gentlemen, I think I can safely take the stand that the climatic conditions in the Islands are such as make it impossible to grow more than two rattoon crops, and these only on new lands in the interior, where the extra cost of transportation to the coast more than counteracts any benefits which might be saved in the cost of a yearly planting.

When our poetical experts of the opposition stand up here and state that 10 or more rattoon crops can be secured from lands in the Philippines they give voice to an opinion which has no foundation in fact, or any possible explanation to justify it in the future. Hot air, gentlemen, pure and simple!

Now, again, I will show to the satisfaction of the committee and to the satisfaction of any cane-sugar expert just why, under existing conditions, it is impossible to grow profitable rattoon crops in the Philippines, even if we allow that the lands could produce them. I don't suppose Mr. Hathaway or his friend noted these facts, for if they did and knew their business they would have seen what the trouble was immediately.

Now, in Cuba, where cane grows like a weed, and where they hold the record for rattoon crops, the cane rows are at least 6 ft. apart and 3 to 6 ft. between seed or hills.

You want to remember that, gentlemen. That is an important item. This gives ample space for the roots to spread and absorb nourishment from the soil. After the first cutting the root has a further chance to spread until it reaches its maximum. As all the mills are modern, employing green bagasse furnaces under the boilers, they have an ample supply of fuel from the crushed bagasse, so that in cutting the cane in the fields the green tops are cut off and left to lie on the ground. These tops form a carpet of several inches in thickness and are allowed to lie there and rot, fertilizing the soil, and by covering the ground as they do they help to retain the moisture and prevent the growth of grass and weeds.

This is one of the conditions which go toward assisting in the growth of profitable rattoon crops in Cuba. Now let us look at the fields in the Philippines, bearing in mind that the mills are of the crudest type and that the *bagasse* after milling has to be dried in the sun before being employed as fuel, and where they have to employ, in addition, the dried green tops also for fuel.

In the Philippines the system employed is to plant in rows averaging 3 ft. apart, and some as near as 2½ ft., and 1 ft. between seed. You want to remember that, too. It is clearly apparent that the root has not sufficient space to expand in or sufficient soil to give it the necessary nourishment after

the first yr., and it also explains why the yield per acre is as low as it is. It also explains why in the few cases where rattoons have been grown they have had to be abandoned as unprofitable after the second yr.

Now, that, gentlemen, is an explanation that I will hold up here, and stand for against any cane-sugar expert in the world.

Mr. CURTIS. Why can they not plant the crop there the same as in Cuba?

Mr. REA. They do not.

Mr. CURTIS. But if they did could they not get more crop?

Mr. REA. I think they might get two crops. I will come to that later.

Mr. CURTIS. I beg pardon.

Mr. REA. I am trying to explain the difference. Now, in cutting the cane for the mill, a man goes ahead cutting off the upper part of the cane for seed and carefully gathering all the tops and leaves. These are all carted to the factory, where the part for seed is cleaned and prepared for planting by immersion in water to cause the eyes to sprout a little, and the leaves are carefully spread out to dry for future use as fuel. Now, it is again apparent, under these conditions, when the field is laid bare to the sun that the moisture is more rapidly absorbed, taking it away from the new sprouts, and the grass and weeds given free rein to grow, thus necessitating the same amount of cultivation and hoeing as the initial crop. With the decreased yield per acre, owing to insufficient nourishment to the root, and the increase in cultivation, it will be seen that the saving in a rattoon crop is hardly sufficient to induce the Philippine planter to continue the practice.

It must also be borne in mind that these rattoons are only grown in the newer lands, removed from the coast; for in the older lands they not only can not grow rattoons, but are limited to one crop of cane every 2 yrs.

That is a point that the beet-sugar people have never dilated on here. They have never brought it to the attention of this committee that the average crop is grown every 2 yrs.

Mr CLARK. Why is that?

Mr. REA. Because in many places the soil is so poor that they can not do it. In some places the soil is not 1 ft. deep. I turned it over to see myself.

Mr. WILLIAM ALDEN SMITH. Suppose it was fertilized. What effect would that have?

Mr. REA. I do not think it would have any effect at all. The enormous rainfall would wash it out.

Mr. CLARK. Do these rains come all at once, or are they distributed somewhat evenly?

Mr. REA. They come along 6 mos. in 1 yr. pretty regularly.

Mr. CLARK. Do they have 6 mos. wet and 6 mos. dry?

Mr. REA. Yes; sometimes it rains for four or five days at a time, and it simply floods you out. In Manila you have to go around in a *banca* at times.

Mr. CLARK. What is a *banca*?

Mr. REA. A little dugout boat.

Now, a question arises here which the gentleman has asked me and which seems to bother many in the Philippines: Can Philippine virgin land grow more than one rattoon crop under an improved system of cultivation? I assert, gentlemen, that the question is one which must be left to time to decide.

Mr. CLARK. Why couldn't you find that out by inquiry? Surely some people have been there quite a long while, and some surely ought to be worthy of belief. Why can't you ascertain that from these people over there just as well as by staying there yourself?

Mr. REA. I could never find out that they got more than one rattoon crop.

Mr. CLARK. Is that your opinion, sir, that they can not get more than one?

Mr. REA. I think they might get two. That is my private opinion, based upon my observations as a cane-sugar man. I would like to be able to state that in my opinion they could get more, but, unlike our friends, I value my opinion and do not care to have it challenged later on; but if, instead of comparing the Islands to Cuba, Hawaii, and other parts of this continent, we take a more liberal view and compare them with adjacent lands in the same part of the world, having the same general characteristics and geological formation and origin, a more commonsense idea can be formed of what the possibilities are.

Mr. WILLIAM ALDEN SMITH. You are giving your information as an expert?

Mr. REA. Yes. I have been in the sugar business for quite a while, and expect to remain in it.

Mr. CLARK. Suppose this land over there plays out, is there any way of restoring that land, as there is down in Virginia, by fertilizing and cultivating and sowing cowpeas, etc.

Mr. REA. I do not know about that. It has never been tried there. It remains to be proven. Mr. Welborn can give us more light on that than anybody else. The Filipinos never use fertilizers. That is a question, however, that has got to be developed by actual practice.

Suppose we take a more liberal view.

Let us leave Cuba and Hawaii out of the question, and make our comparison with the Malay Peninsula and Java, which all belong to the same group and are washed by the same sea. The same race inhabits them, and in all general characteristics they are the same.

What do we find is the case in Java? Here they have no rattoons, but plant their cane once a yr., and their average cost of production is about 1¼ cts. per lb., or, despite the difference in location, climate, soil conditions, and cheaper wages, about the same cost as obtains in the best-equipped centrals in Cuba. It will be seen that the advantage enjoyed by Java in having cheaper labor, as compared with Cuba, is entirely offset by the climatic and crop conditions, which force their planters to plant once a yr. instead of every 6 yrs. as in Cuba.

Now, it is generally conceded that the manufacture of cane sugar is at its highest development in Java, leading the world in its mill and sugar-house results, though behind Hawaii in the development of soil conditions. In Java they have their forced-labor system, and also are free to import labor from China or India. In fact, all conditions there are ideal, but their cost is about the same as Cuba, or 1¼ cts. per lb. One and a quarter cts. per lb. for 96° sugar.

Mr. CURTIS. Ninety-six?

Mr. REA. Yes; 1¼ cts. per lb. for 96° sugar.

Now, if we are going to deal in futures is it not more to the point to accept Java or the Straits Settlements as our standard of comparison? If in the dim and distant future capitalists can be induced to go into the sugar business in the Philippines, installing modern, up-to-date plants and equipments, is it not just to compare their probable results with what is being accomplished just across the Sulu Sea with a similar race and lands geologically and geographically similar?

Mr. BOUTELL. Have you been in Java?

Mr. REA. No, sir; but I am fairly conversant with the conditions there. I have correspondents in Java who keep me posted on conditions there.

The tendency in the Philippines is toward a higher rate of wages, and the wages, which now average 25 cts., will increase to the wages paid in the cities, or 50 cts. At the present time the average wage paid to the laborer in the Philippines is more than is paid to the Javanese. What is the sense in comparing us with the best results in Cuba or Hawaii?

Let me read you a recent clipping on this subject, which will shed more light on the subject. This appeared in the *Louisiana Planter and Sugar Manufacturer* of November 12th, 1904. It is pretty nearly correct, because I compared that with data contained in other letters which I got, and which I published in my paper, from people who are interested in sugar whom I met at Hongkong and at Shanghai. This gentleman writes from Java. I would like to read to you half a column of this, because it is pertinent to the point I want to bring out.

Mr. WILLIAM ALDEN SMITH. What are you reading from?

Mr. REA. From the *Louisiana Planter and Sugar Manufacturer*, the official organ of the Louisiana sugar interests, under date of November 12th, 1904. This correspondent says—coming right down to the point—he says [reading]:

> So far I have not discovered trades unions in Java, and the contrast between wages here and in Australia is painful. It is difficult to find a man in Australia and New Zealand who is not making $2 or more for eight hours' work. Here there are millions who are glad to get 20 cts. for 10 hrs. work. It is only in the cities that the men receive as much as this. In the mountainous regions of the Preanger I saw men and women laboring for less than 1 c. per hr., and in the tea plantations the regular wages are 7 cts. a day for 6 hrs.' work. On the railways the trackmen get 14 cts. gold a day, and on the government farms they receive less. Here in Soerabaya some common laborers get 16 cts. a day, and this is considered high wages.

I simply wanted to bring out that point of wages, because it corresponds with other data that I have secured on the subject. Now, it stands to reason, gentlemen, that the wage rate of Java will never ascend higher than it is at the present time.

Mr. WILLIAM ALDEN SMITH. On that point of wages you admit, if we are to have a domestic sugar industry, we will have to have protection against that kind of a condition?

Mr. REA. That all depends on the cost.

Mr. WILLIAM ALDEN SMITH. I do not want to interrupt you, but I want to know if we must not have protection against that kind of labor?

Mr. REA. No; I do not think you need it, according to statements already published by your people—by the beet-sugar people, I mean. Pardon me——

Mr. WILLIAM ALDEN SMITH. Those are my people.

Mr. REA. I say it stands to reason that the wage rate in Java will never ascend much higher than it is at present, for the population of the Island numbers over 28,000,000, packed in an area of 50,000 sq. ms., while the Philippines, with an area of 122,000 sq. ms., has a population of only 8,000,000. I merely cite these figures to show that while we may look for an increase in the Philippine wage in the future, thus increasing the cost of making sugar there, as compared with our next-door neighbor, the wage in Java will undoubtedly drop lower, placing the Philippine Islands at a disadvantage; so that, when the experts of the opposition presume to come before this committee and state that with the passage of this bill and the reduction of the duties and under modern methods our cost will go down below 1 c., they are talking without a thorough study of the subject.

Now, I am not going to finish this phase of my argument without giving the committee actual proof that what I am stating is correct, and what we may reasonably expect will happen in the Philippines under a system of modern culture and manufacture.

I think no one here will contradict me when I state that the Malay of the Straits Settlements or the peninsula is of the same race and nature as his brother in the Philippines, and we know from observation that his aversion to work is quite as strong. The Straits Settlements, for industrial purposes, are in a class by themselves. The ports are free and open, and they are not hampered by any exclusion laws. The planters there apparently have their pick of labor, but it is nevertheless a fact that, owing to the low rate of wages offered for work in the fields, the natives refuse to enter into the employ of the planters, and take to the more remunerative and less arduous work of the tin mines. The Chinese will not work for the wage offered, approximating 36 cts. Mexican, or 18 cts. gold per day, so the planters have to import their labor from India, under contract for 3 yrs., paying their passage both ways, and even then they find the labor question confronting them at every step.

Mr. CLARK. Will it interrupt you to ask you a question there? Is it true that all the American citizens in the Philippine Islands are clamoring for the Chinese coolies to be let in there?

Mr. REA. No, sir; they are not; none that I have met. A few of them may be who probably do not understand the situation.

Now, I would like to submit for the study of the committee the last yr.'s report of the Perak Sugar Cultivation Company (Limited). This is a stock company with a capital of 350,000 taels with a par value of 50 taels each, operating under the corporation laws of Hongkong. Its shares are listed on the Far Eastern exchanges, and their value at the last quotation was above par, or 68 taels. Their property is located at Perak, in the Straits Settlements, and consists of two sugar estates, one operating as a *muscovado* estate and the other equipped with a mill, evaporating apparatus, vacuum pan, and centrifugals, making centrifugal, or about 96°, sugar.

Their last report, dated November 1st, 1905, which I received in Shanghai from the secretary of the company, states that the crop of centrifugal sugars from the Gula estate totaled up 39,485 piculs, for which they received an average net price of $6 58 per picul, and the output of their Klompong estate, making basket, or brown, sugar, was 27,199 piculs, for which they received an average net price of $3.89 Mexican. The total production of both estates was 66,684 piculs. The picul of China and the Straits Settlements is about 133 pounds, a little less than the Spanish picul of 137.5 pounds, or 5½ *arrobas*, in use in the Philippines, which makes the total output 8,868,792 lbs.

On the next page of the report we find, from the statement of working account for the yr.: The cost of operating the estate and producing the above amount was 223,664 taels. The tael, or Chinese monetary unit, is equivalent to about 66 cts. gold. So we find that it cost them $147,618.24 to produce the crop, or approximately 0.017 c. per lb.

Let me read the details of this cost. They will interest you and will prove that there are other items in addition to mere labor which go into the cost of sugar.

They state here the working account for the season ending July 31st, 1905. To general charges, the estate, 3,756.67 taels; Penang, 1,305.21 taels; Shanghai, 279.33 taels, making the general charges 5,349 taels, office charges. Then there are the launch expenses, 5,349 taels, the launch being used in going up to Penang; hospital charges, 10,908 taels; salaries, 36 346 taels; manufacturing expenses, 40,857 taels; labor, 82,024; upkeep of buildings, repairs and renewals, 17,983 taels; cultivation (manure, etc.), 19,796 taels; fire insurance, 3,367 taels; directors and officers' fees, less transfer fees collected, 1,858 taels; or a total cost of 223,664 taels.

You will note that the item under the head of labor is enormous, or about 35 per cent of the total; but this does not represent the cost of labor in the fields and factory, as that cost is taken up under its own heading. These 82,024 taels represent only the expense involved in transporting labor.

Turning over to the first page of one of the reports, we find under the head "Labor" the explanation and meaning of this. They state in this report:

> Both estates have had a full supply of labor during the season to replace time-expired coolies; 605 new coolies have been imported, and, following the system adopted last year, a proportion of the cost of importation commensurate with the unexpired portion of the contracts has been carried forward as a charge on next season's accounts.

I have been informed by the secretary of the company that these laborers receive about 40 cts. Mexican per day and *chow*, which means food over there, or approximately the same as we pay in the islands to the same class of labor. We are getting down now to the point as to all this outcry about the Philippines, and to prove and bear out our assertion of cost as compared with the places in the immediate neighborhood. If we deduct the 82,024 taels from the total cost of 223,664 taels, we will get 141,640 taels as the cost of raising this sugar, providing the labor was on the ground. Thus we can see that with labor at 20 cts. gold a day operating with modern machinery and a yield of 1.6 tons per acre the cost is about 0.011 c. per lb. These figures are given without adding in the interest, depreciation, etc.

This is a fair sample of the great bogy industry conjured up by the American interests to prevent the passage of this bill.

If you ask me as an expert what it would eventually cost, under a central factory system, to produce a pound of sugar in the Philippines, I should say 0.015 c., or practically the same as in Java, Cuba, Hawaii, and elsewhere, and practically the same as it is now costing under the old antiquated methods in vogue. That is exclusive of interest charges, depreciation, loss of capital, etc. So when Mr. De la Rama or other gentlemen state that it now costs them 1½ cts. without interest, etc., they speak the truth.

Now, you naturally ask, why is it that with a modern mill extracting double the amount of sugar, and a possible increase in yield per acre—why does not the cost cut itself in half in proportion? It would, if the cost was all labor, as is now the case, but our friends forget that whereas the labor price remains the same, the cost of administration, engineers, chemists, sugar boilers, locomotive drivers, defecator men, filter press men, and the many other high-class technical and skilled assistants come into prominence and overshadow mere labor cost. You will note in the report of the Perak Sugar Company that the item of salaries amounts to 36,346 taels, or 1|6 of the total cost, and this only includes the manager and clerical and field staff, as the salaries of engineers and sugar boilers, etc., are included under the proper head of manufacturing.

I think I have demonstrated to the satisfaction of the committee what the probable result in the cost of sugar in the Philippines will come to ultimately, under the most favorable conditions, but it must always be borne in mind that just so sure as an industrial development takes place in the Islands, just so sure will our wage rate increase. Before any action could be taken in building a central factory, or in a yr. or so, the wage rate will have nearly doubled, this owing to the commencement of work on railroad construction which will call for an army of labor. So conditions are bound to change, and to the great detriment of the sugar industry if relief measures are not given in the tariff.

Now, there is another point which I want to bring out before you to show what we might be able to do in the Islands under the most favorable conditions, and comparing it with Java to prove my assertions.

The cost price of Java sugars, as stated, is about 0.0125 c. per lb. on the wage basis of 20 cts. Mexican or 10 cts. gold per day, and a yield per acre of about 40 tons of cane or 4 tons of sugar. Those are the best conditions, the cheapest class of labor, and the lowest cost of producing raw sugar in the world.

Now, Mr. De la Rama states that the average yield per acre is about 1 ton of low-grade sugar in the Philippines, in which he is borne out by the official census for 1902 (and I think that whenever we are in doubt we should take the Philippine census, because it comes pretty near being right), which gives the average of 2,800 lbs., or little over a ton, per acre as the yield in Negros. An estate operating under the *muscovado* system, or this process which we employ—

Mr. MCCLEARY. That is unrefined sugar?

Mr. REA. Yes, sir; or with only one small mill and open-boiling pans secures on an average of 5 per cent in sugar on the weight of the cane. In Louisiana the percentage is 4½, while in some parts of Cuba and the West Indies it will run up to 5½—5¾, according to the density of the juice in the cane. This data, known to all engineers, is the only method of approximating the yield in cane per acre where no scales are employed for weighing.

So in the Islands, where scales are unknown, it is apparent that the yield of 1 ton of *muscovado* sugar per acre is 5 per cent of the cane in the field, which gives us 20 tons of cane as the average yield per acre, and this not every yr. but every other yr. I think that is about right from personal observation. I have driven around the cane fields.

So with modern up-to-date machinery, 9-roller mills and crushers, defecators, multiple evaporators, vacuum pans, crystallizer, centrifugals, under expert administration and chemical control, the best that can be secured is 12 per cent on the weight of the cane, though the average is 10 per cent. So that with our present soil conditions, producing 20 tons of cane per acre, the best we can hope to do in the future is to obtain 2 tons of centrifugal sugar in place of the present ton, as against 4 tons of sugar in Java. So if it costs 1¼ cts. in Java with labor at 10 cts. on a yield of 4 tons, it will cost more like 2 cts. to obtain the same result in the Philippines with a yield of only 2 tons and granting the same wage rate. That is the kind of stuff these beet-sugar fellows want to get at. They ought to have brought it up long ago. If we raise this wage rate from its present stage of 20 cts. to 50 cts. our cost will go up in proportion. When I state, then, that the probable cost of making sugar under modern conditions will be about 1½ cts., I am still taking long chances, unless we can materially improve the production of our fields, and in new regions this may be possible, but never in the older regions of Negros or Pampanga.

Now, I have cited the lowest cost of producing sugar in the world, under the most favorable circumstances. Will anyone please explain to this committee how it is going to be possible for the Philippine planter, paying 50 cts. per day and a yield of 2 tons per acre, to compete with the Java farmer, whose forced labor by the government costs only 10 cts. and his yield double that of the Philippine planter? Will anyone again state before this committee that the passage of this bill will result in the Philippines growing sugar at a cost of 1 c. per lb. downward?

Now, I have finished that phase of the question.

The most important statement ever placed before this committee is here, and I want to submit it. I have a little pamphlet entitled *Should the United States Tariff on Philippine Sugar and Tobacco be Reduced?* and your name (addressing Mr. Palmer) is attached to it. You admit the authorship of it?

Mr. T. G. PALMER. I have not seen what you have. I wrote something with such a title.

Mr. REA. This pamphlet has this heading: "American Beet Sugar Association, office of the secretary, Ebbitt House, Washington, D. C." It is signed by your name. It is a printed pamphlet, which, apparently, was sent to the members of the association to get them together to urge Congress to defeat this bill.

The CHAIRMAN. What is the date of that pamphlet?

Mr. REA. December 29th, 1904. It came to me through the mails in January of this yr., and I have kept it ever since.

Mr. DALZELL. Is it a printed pamphlet?

Mr. REA. Yes, sir.

Mr. T. G. PALMER. I would be glad to have it go into the record.

Mr. REA. I have no objection. There is only one point I wish to emphasize, I do not think the committee has time to listen to all the rest. I do not think you care to have it all read. What I am going to read is a sufficient answer to all the arguments that have been brought forth by the beet-sugar interests in this country in opposing this bill. On page 15 of the pamphlet, the paragraph entitled "Future Cost of Production of Sugar from American Grown Beets," Mr. Palmer states:

> I take it that further Philippine tariff reduction is likely to come in due course of time, but it should not

come until the Philippines greatly raise their wage rate on sugar haciendas and become at least semicivilized, and until the brains and capital already engaged in the home industry, and which will come to it under favorable circumstances if let alone, enable us to perfect the various improvements now under way.

Mr. Palmer starts off by assuming that this tariff reduction has got to come.

Two yrs. ago I wrote you at length concerning my suggestion of producing single-germ seed. The work was begun immediately by the Government, and the first crop of seed from beets grown from 2,500 selected single-germ beet balls has just been harvested. I understand that 30 per cent of this seed came single germ, and the expectation is that in 4 to 6 yrs. more it will be an established thing—

Just keep that length of time in your minds —"In 4 to 6 yrs. it will be an established thing;" one year has already gone by—

saving the farmers $6 per acre of actual labor, eliminating the hand work of thinning on hands and knees, and at least doubling the tonnage per acre on account of no injury being done to the remaining beets by hoeing out the superfluous ones, each plant standing 1 to 3 ins. apart, depending upon how closely the seed is drilled in. If the sugar beets which the farmer now sells to the factory at an average price of $5 per ton costs him $3.50 per ton to produce, his crop grown from single-germ beet balls should not cost him to exceed $1.50 per ton.

The government has taken charge of the scientific work of one of our large sugar-beet seed farms in the State of Washington, and expects to be able to produce a strain of seed as high in sugar content as the best beets selected at the outset, which is 25 to 28 per cent. These mother beets should give factory beets of 23 per cent sugar, and with a loss in extraction of 3 per cent would enable the factory to turn out 400 lbs. of granulated per ton of beets. According to the government report on the home-sugar industry for 1902, the average amount of sugar extracted per ton of beets was 221 lbs.; hence this anticipated extra production of 179 lbs. would nearly cut in two the present factory cost of producing sugar from American-grown beets.

Doctor Wiley, Chief of the Bureau of Chemistry, Department of Agriculture, is to experiment this coming mo. with sugar "concrete," and, if successful, each factory, by increasing its investment 25 per cent, can operate three near-by concrete plants, shipping in the "concrete" to the main factory after the local campaign has been concluded, and thus operating the year through and quadrupling its product, which would greatly lessen the cost of production.

Experiments are being made this yr. with an invention designed to remove the impurities of the juice at the outset instead of from the waste molasses after coming down through all the various processes, the inventor claiming that it will reduce the cost of a beet-sugar plant by 50 per cent, the labor to operate it by 33⅓ per cent, yield an average excess of 20 lbs. of sugar per ton of beets, besides saving several valuable by-products.

All these matters lead to an eventual cost of production of granulated sugar from American-grown beets of something like 2 cts. per lb., but it takes not only money and brains to perfect these improvements, it takes time.

We have the time in 4 to 6 yrs. Now, as all this discussion is hinged on what the possibilities of the industry in the Philippines will be in about the same time, or in the next few yrs., it is clearly apparent from Mr. Palmer's statements that the beet-sugar industry, producing granulated sugar at 2 cts., needs no protection from the raw product of the Islands, which, under the most favorable circumstances of soil, crop, and yield, with modern mills will cost, landed at Iloilo, about 1½ cts. per lb. Add 0.003 freight and insurance, 0.0042 duty, and we have 0.022, to which must again be added the cost of refining and refiner's profit, or something like 3 cts. per lb., before it can compete with the 2 cts. cost of the home article.

Mr. T. G. PALMER. That is single-germ seed.

The CHAIRMAN. We will hear you afterwards, Mr. Palmer. Mr. Rea can go on now. Proceed, Mr. Rea.

Mr. REA. Mr. Palmer continues:

We can offer the Philippine Islands a perpetual market for nearly $200,000,000 worth of purely tropical products annually. But whatever magnitude their sugar industry may reach, those who put their money into it will some day be compelled to fight a battle royal with the educated, scientific American farmer, which will be costly for both and ruinous for one. Never in the history of the world has the nervous energy of the Temperate Zone succumbed to the listless workers of the Tropics, and it remains to be seen whether or not the sugar industry is to furnish the exception. Wise legislation would render such a battle unnecessary and with profit to all concerned. Unwise legislation will surely precipitate it and bring want and sacrifices to both.

Elaborating this further, Mr. Palmer say

A Philippine tariff reduction at the present moment would check all growth of the industry and perhaps result in its complete and early ruination, the bulk of the loss eventually falling upon the farmers. If left alone as at present and given a chance to develop, a few yrs. hence the home industry can snap its fingers at tariff schedules; the American people will be purchasing their sugar at the lowest price known in the world, and every dollar of the $140,000,000 they now annually spend abroad for sugar will be kept at home and will come back to them.

There is one thing you want to stop and think of—to get clearly in your minds—that the beet-sugar people within a few yrs. are going to produce refined sugar inside the tariff wall at 2 cts. a lb. Stop to think what is going to happen to the rest of the world. It costs Mr. Havemeyer and the big refining industry 2 cts. per lb. to purchase raw sugar. Add 1.68 cts. a pound duty and the cost to refine and the profit, the refiner can not handle sugar for less than 4½ cts. per lb. When beet sugar goes down to 2 cts. per lb. what is going to happen to the refineries? You will have them down here yelling for free raw sugar, and cause the whole protection edifice to tremble. What is going to happen to the Louisiana people? What is going to happen to Hawaii and Porto Rico? They have all got to go out of business, because they can never compete with the price of 2 cts. per lb. Cuba can not compete with that price, and what will happen down there? You will have a revolution on your hands. If they do not revolt, the American sugar interests will put up a couple of hundred thousand dollars and see that they do revolt.

Mr. DALZELL. If the rest of that pamphlet is as patriotic as that you read, I think we should have it all in the record.

Mr. REA. There is more of it and there are other items of interest.

Mr. DALZELL. I think that the whole of that pamphlet had better be put into the record.

Mr. REA. Very well, it can go in the record.

You all probably know what the effect of a 2 c. beet-sugar rate is going to have on all the rest of the home sugar interests. What will happen to Havemeyer, Hawaii, Louisiana, and Porto Rico, and what is going to happen down in Cuba? Do not forget the troubles down in Cuba. Any great disturbance on the sugar market is going to breed internal disorders and force armed intervention, and you will have to take the island over on your hands.

Mr. CLARK. As to Java, did I not understand you to say that the Government makes the people work over there?

Mr. REA. Yes, sir.

Mr. CLARK. And makes them work for 10 cts. a day?

Mr. REA. I put it at 20 cts. a day. I know that to be a fact.

Mr. CLARK. How much does the Dutch sugar farmer pay?

Mr. REA. Twenty cts. Mexican.

Mr. CLARK. That is 10 cts. of our money?

Mr. REA. Yes, sir. I know they make sugar there for 1¼ cts. per lb. That is the average cost of production in the Island of Java.

Mr. MCCLEARY. That is unrefined sugar?

Mr. REA. Yes, sir. Our refineries get a chance at that.

There are one or two more points which I would like to bring out. Figuring on the probable increase in our crop in the Philippines within, say, 4 to 6 yrs., I want to say that it would be a mechanical impossibility to draw up the plans, contract for the machinery, build the machinery, ship it to the Philippines, and put a good modern plant in operation in less than 3 yrs. Every one of these gentlemen knows that it could not be done. It is an impossibility. Provided they have the land or have options on the land already, and if they started right now it would take them three years before they got the plant in operation.

Mr. CLARK. Suppose they take a wild piece of land that has never been cultivated—the timber has never been cut off—and undertake to make a sugar plantation there, how long would it take to get the first crop off of it?

Mr. REA. Three yrs.

Mr. CLARK. Why would it take any such length of time as that?

Mr. REA. In the first place the trees have to be cut down and then burned off and sufficient acreage planted the first yr. to have seed to plant the greater acreage for his main crop.

Mr. CLARK. Why can not he buy the seed?

Mr. REA. It would be difficult to purchase, besides it will take at least 2 yrs. to build this machinery.

Mr. CLARK. Where were you raised?

Mr. REA. In New York.

Mr. CLARK. You take in the timber country out West—and it is true, I presume, in the East—the first yr. they skin off the timber and the next yr. they put in a crop. What is the reason they can not do it there?

Mr. REA. There is the machinery to be installed.

Mr. CLARK. You do not need any but the ax.

Mr. REA. You asked me how long it would take to start a modern plantation there?

Mr. CLARK. How long it would take to skin off the timber and start the first crop?

Mr. REA. About 18 mos. for any extensive area of land.

Mr. WILLIAM ALDEN SMITH. The sugar land is not timbered land, is it?

Mr. REA. What the people call "sugar land" is not timbered. If I were going into the sugar business in the Philippine Islands, I would buy timber lands, and I think in our experience in Cuba after the war sugar men gave the go-by to the old worn-out lands in Matanzas and Habana provinces and went to the eastern end of the island and bought new virgin lands covered with forests—at least the gentlemen I represented. We had a large contract with Mr. Havemeyer for the erection of a sugar mill.

Mr. CLARK. You could not raise but one crop in 2 yrs. because the land was not rich enough?

Mr. REA. Yes, sir.

Mr. CLARK. How does it help the land any to give it a rest for a year?

Mr. REA. It gives it a chance to recuperate.

Mr. NEEDHAM. How much did you have to pay for that sugar land in Cuba?

Mr. REA. I do not think I am at liberty to say what we bought it for, but I can state that lands can be bought for less than $5 an acre. It has been repeatedly urged that immediately on the passage of this bill the American capitalists are going over into the Islands, down into the Island of Negros, and buy up those old worn-out sugar lands, which their owners hold at $40 or $50 gold per acre. That is their assessed value. Is it reasonable to suppose that sugar men will buy that land when they can go down to Cuba and secure the best lands in the world for $5 or less an acre? I know it can be bought in Cuba for that price and is being bought now, while in the Philippines if we can induce any of our capitalists to go out and buy the absolutely virgin land in some of the near-by islands it will take time to develop it—at least 4 or 5 yrs.

Mr. Palmer spoke about the great fertility and possibilities of the Island of Mindanao. I do not know whether Mr. Palmer knows it or not, but our labor question in Mindanao is very acute and, as a matter of fact, we can not get the Filipinos—that is, the Christian native—to go down there and work. The Mindanao Moro has a very effective method of dealing with his Christian brother. They do not migrate down there and you can not induce them to.

The CHAIRMAN. There is a very strong prejudice and there would be a war in a minute.

Mr. REA. The war would be one-sided, to the detriment of Filipino labor.

The CHAIRMAN. There would not be any more Filipino laborers?

Mr. REA. No, sir.

Mr. CLARK. Perhaps we had better send them all down there; I do not know.

Mr. WILLIAM ALDEN SMITH. How long have you been in the Philippines?

Mr. REA. Two yrs.

Mr. WILLIAM ALDEN SMITH. Where were you before you went to the Islands?

Mr. REA. In New York, and previous to that I spent 4 mos. in Porto Rico helping to make contracts for the location of a large sugar factory there. Previous to that I represented Mr. O. B. Stillman in Cuba as his manager. He is one of the largest cane-sugar men in the island. He has offices in New York and in Habana, and also represented the Havemeyer interests in Cuba. He is general manager of the Trinidad sugar plantation, one of the largest in Cuba.

Mr. WILLIAM ALDEN SMITH. What is your business in the Philippines?

Mr. REA. I am publisher of THE FAR EASTERN REVIEW, published in Manila.

Mr. WILLIAM ALDEN SMITH. That paper is for absolute free trade between the Philippines and the United States?

Mr. REA. Yes, sir.

Mr. WILLIAM ALDEN SMITH. You are a free trader yourself, are you not?

Mr. REA. I am like Mr. Welborn. I believe in good protection occasionally.

Mr. WILLIAM ALDEN SMITH. But on general principles you are a free trader?

Mr. REA. No; I am a Republican and a protectionist.

Mr. WILLIAM ALDEN SMITH. Your paper advocates free trade?

Mr. REA. Yes, because it is just. It is justice to the Philippine planter and to your fellow-countrymen who are out there doing their country's work trying to educate these people, and who are bearing the brunt of the struggle. They should be given fair play.

Mr. REA. Yes, sir. I am a newspaper man and receive all the newspapers. I have read these things and know what was said. Give us a square deal. That is the only thing that one American can ask from another.

Mr. HILL. You said that you had been several mos. in Porto Rico. Do you know of any reason, from your experience in both countries, why the United States should not extend equal treatment to both countries?

Mr. REA. I see no reason whatever.

HONGKONG AND SHANGHAI BANKING CORPORATION

The ordinary half-yearly general meeting of the shareholders in the Hongkong and Shanghai Banking Corporation was held Saturday, February 24th, at noon, in the city hall at Hongkong. It was presided over by Mr. H. A. Slade, chairman of directors, and there were also present a large number of gentlemen interested in the corporation. The chairman read the report of the directors which gave a general statement of the affairs of the bank, and the balance sheet for 6 mos. ended December 31st, 1905 The report showed that the new profits for the period, including $1,702,728.85, balance brought forward from previous account, after paying all charges, deducting interest paid and making provision for bad and doubtful accounts, amounted to $4,864,395.72. The directors recommended the transfer of $1,000,000 from the profit and loss account to credit of the silver reserve fund, which fund now stands at $9,500,000. After making this transfer and deducting remuneration to directors, there remained for appropriation $3,849,395.72, out of which the directors recommended the payment of a dividend of £1 15s. sterling per share, which at 4/6 will absorb $622,222.22, and a bonus of £1 sterling per share, which at 4/6 will absorb $355,555.55. The difference in exchange between 4/6, the rate at which the dividend and bonus were declared, and 2.09|16, the rate of the day, amounted to $1,171,840.55. The balance, $1,699.777.40 was recommended to be carried to the current profit and loss account. In presenting the report, the chairman said:—

GENTLEMEN:—The report which I have read on the half-yr.'s working of the bank is no exception to the favorable statements your directors have had the pleasure of laying before you for many yrs. past, and I think there is no doubt it will meet with your approval. I hope that the proposed distribution of profits will also prove satisfactory to you. We recommend the addition of $10 *lacs* to our silver reserve. In June last we increased the dividend from £1 10|- to £ 1 15|-, and I am glad to say that so far results have warranted that step. We are able to again propose a dividend of £1. 15|- and also a bonus of £1, making a distribution of £4 10|- per share for the yr. As regards the amount of the bonus, while circumstances have again been exceptionally favorable I feel that I must repeat the caution uttered by my predecessor in the chair to the effect that the £1 bonus should not be looked upon as a recurring certainty; more especially in view of the fact that we have since added 10|- a yr. to the ordinary dividend. It is only fitting that I should say at once that the thanks of shareholders are due to our managers. agents and staff generally, and I am sure you will approve of our action in voting them a bonus of 15 per cent on their salaries.

Turning to the balance sheet you will find that our note circulation shows an increase of $30 *lacs* compared with the figures on 30th June last, while silver current accounts are some $60 *lacs* less, reflecting the usual demand for money at the end of the yr. The withdrawal of some of the loan funds temporarily lodged with us in London accounts for the decrease in gold current accounts. Deposits in gold remain practically unchanged, while silver deposits show an increase of $25 *lacs*. Outstandings under the heading of bills payable are $12 *lacs* less than 6 mos. ago. On the other side of the account you will see that we are in a very strong cash position. Coin lodged with the Hongkong Government against excess note issue has risen from $8,500,000 to $10,000,000, our cash shows an increase of $30 *lacs* and we have about $11 *lacs* more bullion in hand and in transit. These increases are mainly accounted for by the expansion in our note issue already referred to and by the preparations made for the usual requirements of trade at this period of the yr. Indian Government rupee paper, and consols, colonial, and other securities stand at $11,344,370.38, against $13,950,599.64 on 30th June. Sterling reserve fund investments remain unchanged. Current exchange is now over 2/-, the rate at which our gold reserve appears in the balance sheet, but any difference on that account is more than counterbalanced by the price at which the sterling investments stand in our books as compared with their market value. Bills receivable are lower by about $13,000,000, and there is a similar reduction in bills discounted, loans, and credits. The dollars totals shown in the balance sheet, although higher than a yr. ago, are less than on 30th June; this, however, is accounted for to a large extent by the rise in the price of silver and the consequent higher level of exchange. The confident expectation that a revival of trade in the Far East would result immediately upon the conclusion of peace between Japan and Russia has not been altogether fulfilled, but though more slowly than was at first anticipated, yet surely the signs of renewed activity appear.

With reference more particularly to the region directly affected by the war it is noteworthy that an agreement has been arrived at between Japan and China which, if interpreted in a wise and statesmanlike spirit, should eventually secure for all the great commercial nations interested the obvious benefit of the maintenance of the open door in Manchuria and equal trading opportunities for all, thus realizing the aim which has been so steadily advocated from this chair for many yrs. We must not forget that it takes considerable time to move large bodies of troops, and this operation has involved the requisitioning of all available means of inland transport, preventing the free distribution of merchandise to the various markets in Manchuria. Notwithstanding these difficulties, however, a considerable business has been done and there seems every reason to expect that on the opening of the Northern ports and with transport available throughout the country, we shall see a greater demand for foreign manufactures and the opening of new and more extended markets in this large and important province.

Gentlemen, the bank continues to improve its position; we have made a good start for the present half-yr., and I think you may safely look forward with confidence to the future. (Applause.)

There were no questions, and the chairman formally moved the adoption of the report and accounts. Mr. J. A. Jupp, in seconding he motion, said:—

I feel I am only voicing the sentiments of all shareholders present in congratulating the directors, the chief manager and staff on the splendid results they are again able to place before us. The bonus of 15 per cent of their salaries voted to the staff, I am confident, meets with the very hearty approval of all shareholders. (Applause.) As regards the dividend and bonus proposed to be distributed we have also good reason to be pleased to see a gradual increase of returns to shareholders. We are all relieved, I am sure, that the terrible war which raged for 18 mos. in this part of the world is now a thing of the past and that a revival in trade is beginning to be apparent. The strong position attained by the bank should, I think, be a source of congratulation and pride not only to its shareholders but to the whole colony. The colony and corporation have grown up together, so to speak, and each has contributed to the growth of the other. (Applause.) I cannot, I think, do better, therefore, than conclude these few remarks with the wish that they may long continue to thrive and flourish to their mutual benefit and to the good of us all. I have much pleasure in seconding the adoption of the report and accounts. (Applause.)

Mr. C. H. Thompson moved the re-election of Messrs. H. A. W. Slade, E. Shellim and E. Goetz as directors and the confirmation of the appointment of Mr. C. R. Lenzmann as a director in place of Mr. H. Schubart who has left the colony. Mr. C. H. Rogge seconded. Carried.

Mr. S. Hancock moved the re-election of Messrs. W. Hutton Potts and A. G. Wood as auditors. Captain Tillett seconded. Carried.

Dr. Noble said:—

GENTLEMEN:—Before we part, I would like to ask you to join with me in a hearty vote of thanks to the court of directors, the chief manager, managers and staff, all of whom have labored diligently and faithfully on our behalf. They are each and all deserving of the greatest praise for the able manner in which they have managed the enormous funds entrusted to their care, and the results produced as shown in the accounts just submitted to, and passed by you. As each report is issued I always remark that I cannot imagine how on earth they contain such a standard of excellence. But they do. I, therefore, propose a vote of thanks to the court, the able managers and staff generally. (Applause.)

This terminated the meeting, all present proceeding to the unveiling of the statue of the ex-chief manager, Sir Thomas Jackson.

HONGKONG AND WHAMPOA DOCK CO., LIMITED

The ordinary yearly meeting of the shareholders of this company was held in Hongkong, February 25th, at the offices of the company, Queen's Buildings, and was presided over by the chairman, Sir Paul Chater, Kt., C. M. G., who, after convening the meeting, addressed the gentlemen present as follows:—

GENTLEMEN:—The report and statement of accounts having been in your hands for some days, I will, with your permission, following our usual course, take them as read. The net profits for the half-yr. ending 31st December, 1905, amount to $171,649.83 as compared with $328,200.51 for the first 6 mos. of the yr., and $370,159.03 for the corresponding period of 1904; a falling off which I am sure we all greatly deplore. To this sum must be added the sum of $501,332.27 the balance brought forward from last account, and after deducting directors' and auditors' fees, we have available for appropriation the sum of $662,232.10, which sum your directors propose, subject to your concurrence, to deal with as follows:—To pay a dividend for the half-yr. of 12 per cent or $6 per share, absorbing $300,000, and to carry forward the balance $362,232.10 to a new account. While, as I have already said we must all deplore so poor a result for the past 6 mos., it was, you will recollect, foreshadowed to some extent in my speech to you from this chair in August last, when I said I was afraid, from various causes, we could not look for any substantial improvement in the immediate future, and it is to be regretted that the depression in business then referred to cotinued throughout the remaining mos. of the past yr. Happily, since we last met, the peace between Russia and Japan, then looked forward to, has become accomplished and the improvement in our business confidently expected to result therefrom will, I trust, have become apparent before I have occasion to again address you.

We have not been idle in our efforts to already secure a share of the work to be done in vessels of the Russian Navy, but owing to our No. 1 dock being unable to accommodate their battle ship *Czarewich*, we have so far obtained no work from them worth mentioning, and from this cause also, gentlemen, I regret to say we lost the steamers *Minnesota* and *Dakota* which were obliged to go to Japan to be docked.

The tonnage of ships docked during the last 6 mos. shows a slight falling off of some 290 tons, the figures for merchant vessels stand at 458,312 tons as against 392,731 for the last half-yr., and for war vessels 29,130 as against 95,000, of this latter only some 3,013 tons represent foreign men-of-war, but I hope that, in this connection, we shall see a considerable improvement during the current 6 mos., as we have now on our books four American battleships, and with the resumption of trade with this port by Japanese steamers, we may reasonably expect an increased share of the merchant shipping.

The new work in the shipbuilding yard referred to in my last speech has been carried on satisfactorily; we have completed and delivered the three large steel steam waterboats, a steel water barge for the United States Government at Manila, two large wooden lighters for local use and two small steam tugs for service at neighboring ports. The large steamer for the Yangtsze trade and the cargo lighter for Bangkok are making good progress, and we have recently secured an order for twelve large wooden lighters which, together with various contracts for steel work for the Hongkong Milling Company, cast-iron columns, etc., for new buildings, help to keep our works profitably employed. The work of installing the electric drive in the saw mill is still in progress and will be completed during the present half-yr. on the arrival from home of the motors, and we have now on order an improved planer and a new lathe. The earnings of our dredger *Canton River* are small; the employment which I told you we had in view for her on the completion of her work at Canton having failed of arrangement. The value of materials on hand has increased during the period now under review by some $150,000, mostly for the new Yangtsze steamer now buliding and other contracts.

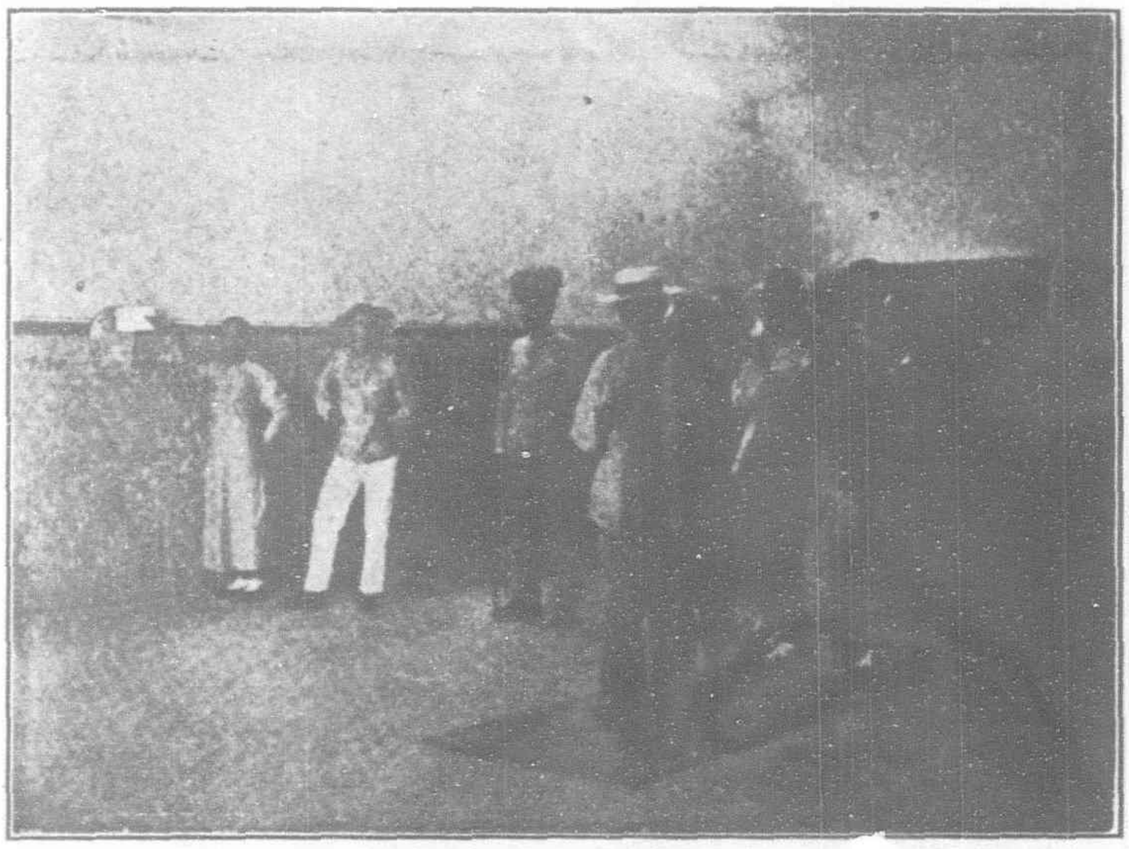
Mr. Salinger proposed and Mr. Parlane seconded the confirmation of the appointment to the board of Mr. G. H. Medhurst, Hon. Mr. C. W. Dickson and Mr. S. Silverstone. Carried.

The re election to the board of Mr. H. P. White and Mr. E. Goetz was carried on the motion of Captain Tillett, seconded by Mr. Wilks.

Messrs. T. Arnold and H. U. Jeffries were re-elected auditors on the motion of Captain Unsworth, seconded by Mr. Leiria.

COLLECTING, PREPARING, AND TRANSPORTING CHINESE LABORERS TO THE TRANSVAAL MINES

In an official report to Washington, Consul-General Ragsdale, of Tientsin, N. China, describes the system established, with the approval of the Government of China, for the enlistment of coolies for work in the mines of the Transvaal. The methods of collecting, preparing, and shipping the Chinese are described, and the agreement as to wages and treatment are explained. The indentured coolies are under contract with the Transvaal Chamber of Mines, and the wages of each are from 1 shilling 6 pence to 2 shillings 6 pence per day, exclusive of subsistence, for the supply of which the contract makes provision.



MEDICAL EXAMINATION

This new industry has been particularly thrifty in N. China, the coolies being indentured to the Transvaal as unskilled laborers in the gold mines of the Witwatersrand District. Since the close of the S. African war it has been found that the supply of native Kaffir labor was insufficient for the full development of the mines. Unskilled white labor has been tried on some of the mines, and has always resulted in failure, for the following reasons:—

The climate is not suitable for the white man as a laborer.

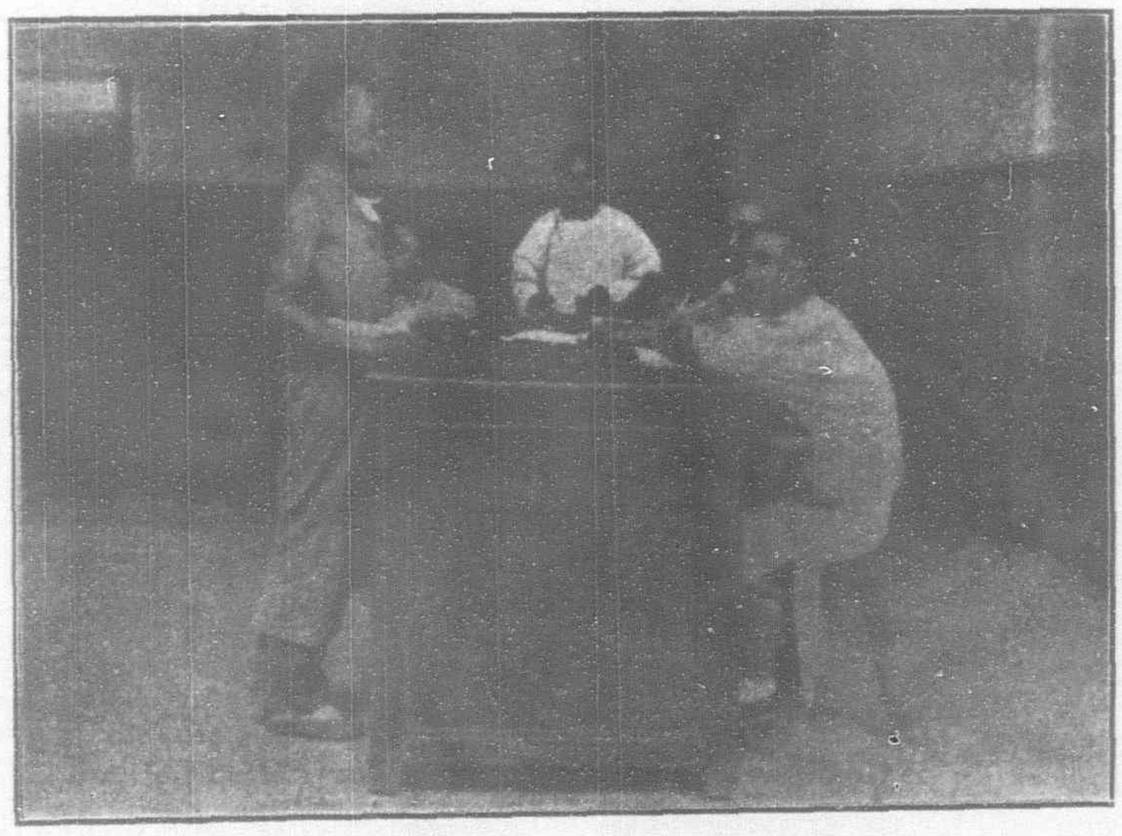
The cost of living is so great, that for a white man to live in decency with his family, the wages necessarily are much greater than the mining conditions will justify and the mines could not be worked. White men working for wages justified by the mines must be content to live in such a manner that they soon become degraded, lose their self-respect, and are known as "white Kaffirs," being as much separated from their own people as are the natives, and, in large numbers this type of poor whites would become a serious social menace.

It has been proven an impossibility for white and black laborers to work side by side.

FAILURE OF INDIAN AND KAFFIR LABOR.—Indian laborers have been tried without success. They are not good miners, can do but a small amount of work, and their strict rules of caste make it difficult to handle large bodies of them in an alien country. When the mines were reopened after the close of the S. African war the schedule of wages was less than before the war. As the lack of labor became a serious matter, the wages were increased in the hopes that the available labor would increase. These hopes did not materialize. The habits and instincts of the Kaffir are the same as the other natives of Africa. None of them are workers beyond what is absolutely necessary for a hand-to-mouth existence. Four or 6 mos.' work in the mines provides them with sufficient means to live the remainder of the yr. The increase of wages instead of improving the labor conditions had an opposite effect, as the Kaffir could obtain the requisite amount of money in less time.

DEFICIENCY IN NATIVE LABOR.—In addition to all this there is the fact that even if the native labor was satisfactory there are not a sufficient number of natives available. The entire population available for native workers is less than 4,700,000. As only those between the ages of 15 and 40 will undertake outside employment, the selection is limited to 10 per cent, or 470,000. Dividing this by two, as the natives will not work more than 6 mos. each yr., there is a total available supply, in the districts where recruiting is allowed, of 235,000. The present shortage in the Transvaal in all industrial and agricultural operations is 220,000. The number of natives employed is 182,000, thus leaving only 53,000 to supply this immediate shortage, of which the shortage in the Transvaal mining industry alone is 130,000. Thus will be seen the necessity of recruiting from some outside sourcer,and from all sources available the most favoable is China, particularly N. China. The Chinese are quiet, sober, hard workers, not given to dissipation of any kind, economical and thrifty, anxious to save all their wages possible and eventually return to China. As competitors in the labor markets of the world they are feared by the white man for their virtues, which are many, and not for their vices, which at present are few

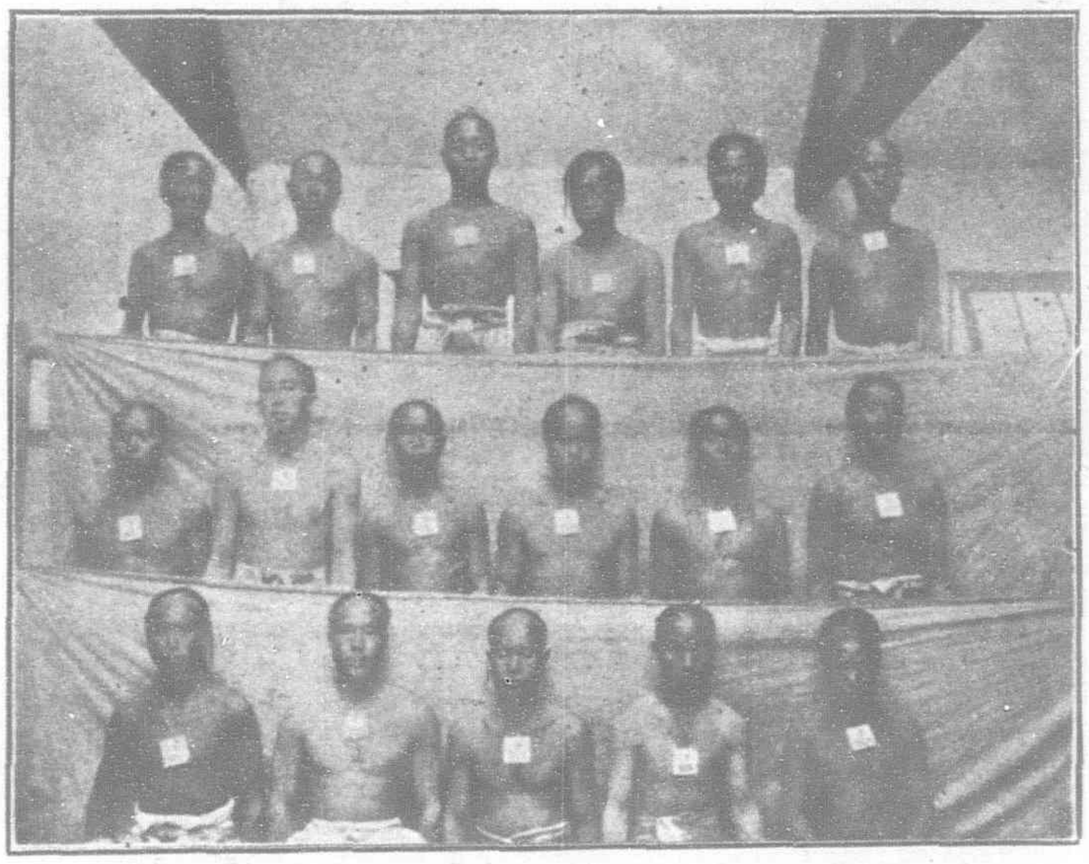
INCEPTION OF THE COOLIE MOVEMENT.—It must be remembered that the cost to the S. African mining companies of the Chinese coolie is much greater than the cost of the Kaffir, and that the profit, if any, will consist in the greater capacity for work in the individual and the increased security of the mine owners against unexpected shortage. This experiment with indentured Chinese labor is the result of a thorough investigation of the labor question by the Transvaal Chamber of Mines, and the carrying on of the work in China is in the hands of a labor importation agency appointed by this chamber of mines. This work was sanctioned by the British Government by the passing of the Transvaal Labor Importation Ordinance. The commissioners of the Transvaal Chamber of Mines arrived in China during the winter of 1903 and at once commenced negotiations with the Chinese Government in Peking for permission to export coolies. After completing in a satisfactory manner these necessary arrangements the commissioners inaugurated the actual work of collecting the coolies. Contracts for this work were given to two British concerns in Tientsin—Messrs. William R. Forbes & Co., and the Chinese Engineering and Mining Company, Ltd. For each coolie delivered at the port of embarkation and passed by the medical examiners a fixed sum is paid these contractors. The contractors pay all cost of collecting the coolies and supplying them with food and transportation to the point of delivery. Any coolies failing to pass the physical examination are a loss to the contractors. The contractors at once through their compradores (Chinese agents) established collecting stations in various parts of the Provinces of Chihli and Shantung, from which went out small agents to preach the gospel of the Transvaal and collect coolies. The first shipments were collected from Tientsin and Tongshan, as the coolies were numerous and near. Later, as the coast supply decreased, the agents pushed inland.



REGISTRATION

METHODS OF COLLECTING.—The inland collecting stations were usually at some town having a resident foreign missionary doctor, who made a preliminary examination of the coolies before

they were sent to the coast. This examination was at the expense of the contractors. The accepted coolies were marched to the nearest railway station and forwarded to the shipping point. In a short time Chinwangtao was made the main shipping point and an immense depot was established there. Near the beach but well above the reaches of the sea was built a large compound, surrounded by a high brick wall. In this compound are 16 separate barracks, each 100′×45′, with walls some 20′ high. On the two sides of these are two wooden platforms 6′ wide, one above the other, extending the entire length of the buildings, which are of brick, plastered on the inside, a lath and plaster ceiling, and cement floors. They contain ample windows and doors and in winter are furnished with large coal stoves; better quarters than the coolies ever had before. Each barrack can furnish quarters for some 400 coolies, and each has a well-built detached kitchen of ample capacity. Along the seaward front of the compound are the administration buildings, including the examination rooms, offices, etc. The residences of the foreign employees are built outside of



ACCEPTED FOR THE TRANSVAAL

the compound and a econsidrable disthcee from it. At one end barriers are run from tan compound wall across the fine beach to deep water and the coolies have sea bathing when they wish.

Detention and Examination.—The coolies arrive in lots of from 200 to 300 and are placed in a small detention compound. Each one is stripped and examined by the doctors. This physical examination is most thorough, including tests for eyesight and hearing. Those accepted pass into an immense tank of warm water and are scrubbed with soap. They are then vaccinated, photographed, and their identification cards written up. A number is hung about their necks and they are ushered into the large compound. where they remain until the next transport sails. In the meantime they are furnished with a copy of the contract they are to sign both in Chinese and English. At all hrs. of the day special Chinese clerks take them individually and explain each clause of the contract in the simplest manner possible and in every detail, until each coolie understands where he is going, for what purpose, and under what conditions, and in what manner he will be repatriated.

These Chinese instructors are under the control of the Chinese Protector, an official of the British Government in no way connected with the Transvaal mines. His duties are to see that until the coolie leaves China the white man adheres, both in letter and spirit, to his part of the contract; that each coolie understands what engagement he is entering into, and that he enters into this engagement of his own free will and not because of outside pressure. While waiting for the transport the coolie, for the first time in his life, probably, does no work, and has not a care, is clean, and has all the food and tea he wishes. He has no opium and no Chinese spirits. The change in the coolie is marvelous; he straightens and squares his shoulders, the wrinkles of worry disappear, and he simply exudes contentment. The shipping of the coolies is a slow process, is each must be re-examined by the doctors on the day of embarkation, and about 400 per day as the limit.

No Room for Misunderstanding.—The day before shipping, the coolies are taken in lots of 10 to the office of the Chinese Protector for a final examination in the catechism of what they are about to contract for. The questions asked are many and cover every possible point on which could hang a misunderstanding. Following are some of the questions:—

Where are you going? How long will you be at sea? What will happen when you arrive at the Transvaal? At what will you work? Can you work as carpenters, machinists, etc.? At what wages? Can you leave money in China for your family? How much? How many hrs. will you work a day? How many days per week? etc. Do you go of your own free will?

These questions are propounded until all understand, when the coolies are thus addressed:—

"If there is any coolie here who regrets having come and does not wish to go to S. Africa let him come forward. Any of you are at perfect liberty to go home now if you choose. There is no punishment and no money for you to pay if you have changed your minds. You have only to tell me and you may walk out of the compound and go home. The only requirement is that you leave Chinwangtao within 24 hrs."

Only about one in 200 coolies leaves at this point, and any excuse he may give is accepted by the Chinese protector.

The next day is the final medical examination and shipment. In a large hall stand or squat some 200 coolies in rows along the wall. Their only clothing is a piece of string and a paper tag. In the next room are the doctors and the Chinese clerks. The coolies enter one by one. They are compared with their identification card. If passed they cross the room to a Chinese clerk who checks their name on the roll. They are then passed into the next room and into the tank through which warm water flows constantly. Here they leave behind all remnants of Chinese dust, and passing into the dressing room, put on new clean clothes, shoes, belts, socks, straw hats, etc., and reappear in dark-blue uniforms, no longer mere Chinese, but wearing on the front of the coat in Chinese characters the legend "Nan Fei Li Kung."

Tagged, Washed and Paid.—In the next room are three desks with Chinese clerks and a foreign supervisor. At the first the paper tag is changed for a lead disc with a number on it. This is fastened about his neck, and he is sent to the desk at which he arranges for a portion of his wages to be paid in China each mo., to his wife, father. or other person designated by him. This is done by means of a coupon pass book. Next he goes to that most interesting desk of all, the paymaster's. Here he receives $38 (Mexican), 2 mos.' pay, and $8 bonus. The majority never owned a silver dollar before. The money is laid out and counted in front of him. It is then pushed into a small tin pan, which will later serve him as a rice bowl, and he is passed to the next room, where he signs his contract, before which, however, he has one more chance to retreat if he so wishes. No one has ever retreated at this point.

The next room is a long hall divided lengthwise by an iron grating. On the one side the hall opens into the outside world; on the other into the compound. It is here that the S. African laborer bids farewell to his family and creditors. It is not a pathetic sight If his creditors leave him any of his newly acquired wealth his relatives argue with him for it, and fortunate the coolie who escapes to the next room with any money Here he receives his kit bag containing a full winter outfit of clothes, blankets, a tin cup, and everything he can possibly need on the trip, including a small bamboo pillow with folding legs to serve as a seat by day. They walk out with their bags on their backs, enter the train, and are taken at once to the dock, where they are changed to a waiting lighter and towed to the transport. Everything is clean and comfortable for them. Rules prescribe the number allowed on each transport, and they sail away with no work to do for a mo. and all they can eat. They are a most cheerful crew.

Results of the New Industry.—Following are the results of this new industry to the present. The first shipment of coolies was made from S. China in May, 1904. The total number of shipments from all ports to date is 29 The total number of coolies shipped from all parts of China is approximately 49,000. Of these 28,000 have been exported from Chinwangtao and 5,500 from Chefoo. The number of deaths during the voyage have been only three or four per trip. In reference to the mortality among the coolies after arrival in S. Africa, Mr. Ragsdale has been unable to procure exact data, as the records of the 15,500 shipped from S. China are not available in Tientsin. But from statements published in Johannesburg the health of the coolies has been eminently satisfactory, with the exception of those exported from the southern provinces. This difference was so marked that all exportation from the S. was soon stopped and only the strong rugged northerner is now taken. Of the 33,500 taken from the N. less than 300 have died from sickness. The total deaths have been 15.5 per thousand, of which 2.4 per thousand were due to accident. The number repatriated at the expense of the mines has been about 1,000, of which 204 were from the N. Less than 50 have returned to China at their own expense. Of the total number of coolies sent to Chinwangtao those rejected by the doctors after examination have amounted to about 30 per cent, thus showing great care used in final selection and to some extent the lack of care in the collecting.

There is one important omission in the Transvaal labor ordinance. It allows only the importation of unskilled labor for manual work in the mines. There is no provision for importation of the necessary Chinese clerks, secretaries, and interpreters. It is impossible to obtain sufficient Chinese-speaking Englishmen to perform the necessary work in Chinese involved in the importation of a large number of coolies into an English-speaking country. The few who speak Chinese fluently and are suitable for the work receive good pay in China, and the lower class of Chinese-speaking whites are in no way suitable for the work, as they are usually unreliable and the creators of everything but harmony. English-speaking Chinese are in every way preferable, as they thoroughly understand their own people, and with the exercise of ordinary care inthe selection, they are reliable, trustworthy, and nondisturbing workers

LARGEST HYDROELECTRIC INSTALLATION IN SOUTHERN ASIA, MYSORE PROVINCE, ASIA.---II

(By A. C. HOBBLE.)

The three exticer units are 4-pole, 75-kw. machines, operating at 465 r. p. m., and over-compound from 110 to 115 volts at no load and full load respectively. With a power-factor of 95 per cent one exciter is capable of supplying the necessary generator field excitation with a station load of 5,500 kws. Since the ultimate total output of the plant is between 6,500 and 7,000 kws. it will be necessary to operate two exciters in multiple. The third exciter unit is a reserve, being operated, however, during the night for station lights. All wiring and cables leading from the generators and exciter units through the long stone cable duct to the transformer station on top of the bluff are lead-covered.

two total output, two line switch control, two voltage regulator, and five local panels of blue Vermont marble, is situated on the main floor, or second deck of the 3-deck arrangement. The 2,200-volt oil switches, bus-bars and disconnecting switches are located on the ground floor, while all of the high-tension switching apparatus, with exception of transformer oil switches, is located on the third floor or gallery. In addition to the usual voltage, power and current meters on the low-current switchboard are also two frequency meters, two synchronizing instruments and one power-factor meter. The synchronizing arrangement for both generators and the two sections of the 2,200-volt buses is an

hand to have all rheostatic resistance *cut in* in both generator-field and exciter-field circuits. The voltage is gradually brought to normal by turning out resistance from the exciter-field circuits. To assist the hydraulic operator in the generating station in holding the correct speed for paralleling alternators a synchronizing lamp is located on each generating panel. The switchboard attendant in the transformer station above throws the machines in parallel at the proper moment indicated by the pointer on the synchronizing instrument.

HIGH-TENSION SWITCHBOARD.—The old high-tension switchboard is composed of six double-



INTERIOR OF TRANSFORMER STATION AT SIVASAMUDRAM, SHOWING LOW-TENSION SWITCHBOARD AND POWER TRANSFORMERS

STEP-UP TRANSFORMER STATION AND EQUIPMENT.—It is due to the fact that the generating plant is situated in a very veferous locality that it was decided to locate the transformer station on top of the bluff (400′ above the generating station), thus making it more habitable for the switchboard attendants. Hence, all the essential switching and controlling apparatus is located in the transformer station, 1,000′ distant from the powerhouse. The generator voltage, varying between 2,000 and 2,250, according to the load, is raised to approximately 35,000 volts through seven banks of 350-kw. General Electric air-blast transformers. The transmission voltage was formerly 30,000, but during the second installation and owing to increase of power to be transmitted the line pressure was raised to 35,000 volts by replacing the 30,000-volt coils with new ones wound for the higher voltage. In this way and through other means to be described herein, the line loss has been kept at a reasonable value.

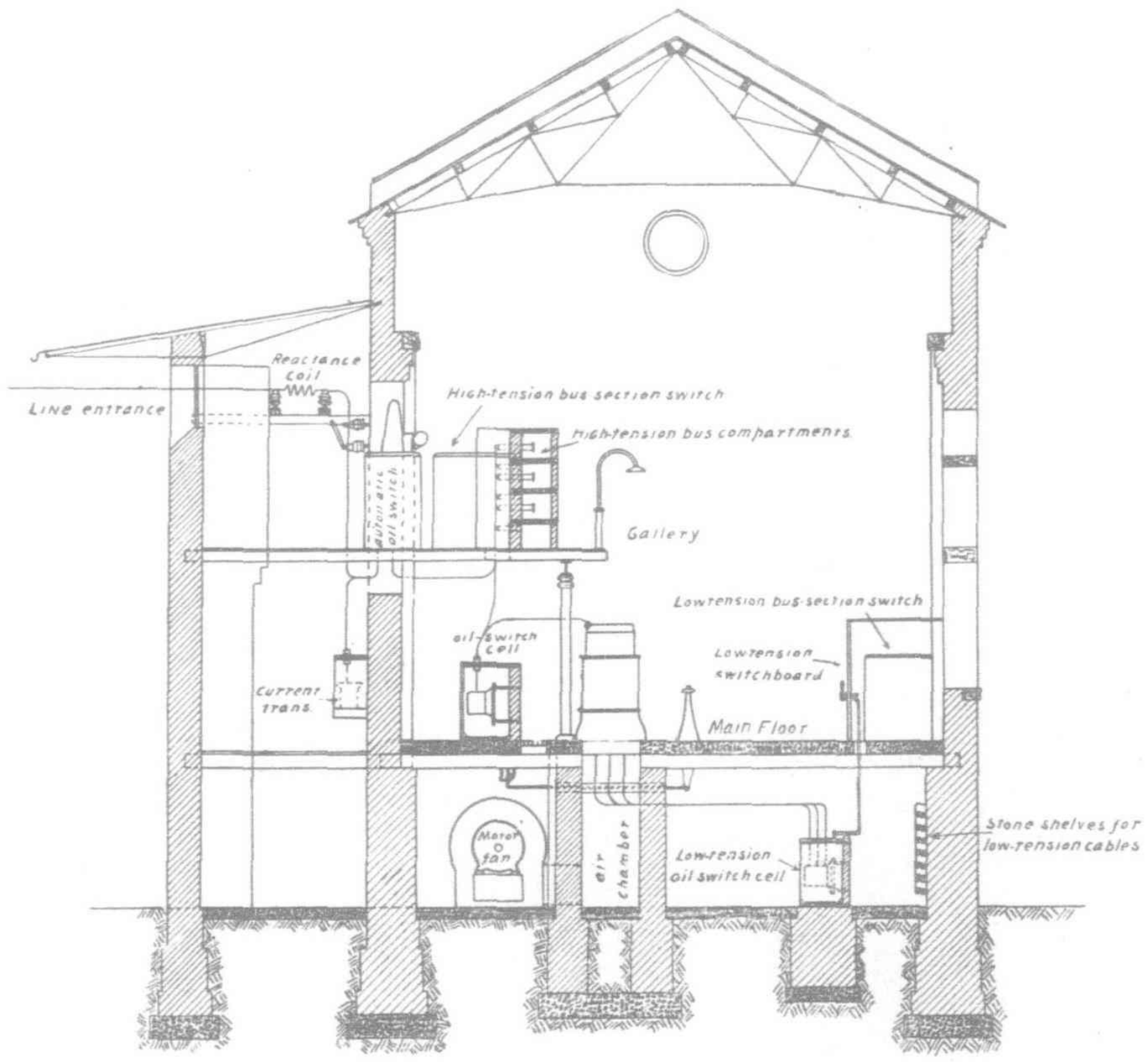
SWITCHING ARRANGEMENT.—The low-tension switchboard, consisting of 11 generator, two direct-current exciter, seven transformer bank,

interesting study. This latter feature is one to which particular attention is called. The plant may be operated as a whole or in two separate plants, as desired. Repairs may be made with facility without disturbing the general operation of the plant. Many prominent engineers consider desirable, as a means of increasing reliability and continuity of service and the factor of safety against complete shutdowns of plant, the operation of the same as two entirely separate plants. Provided the power plant is being operated in this way, it is easy to unite the two sections quickly as one by synchronizing the low-tension buses at the generating end of the transmission lines. This is made possible by the quick-acting, 2,200-volt, motor-operated oil switch located between the two sets of low-tension buses.

On starting up the plant after a complete shutdown due to any cause, much time and trouble is saved by synchronizing all of the generators at the same time. This is accomplished by closing the mains and field switches of all of the generators and then closing the main exciter field switch, taking care before-

line switch panels, and one panel upon which is mounted a 3-phase electrostatic ground detector. All are of blue Vermont marble, supported by a heavy wooden framework, allowing 3′ to each phase. On the new high-tension side of the transformer station a cheap construction is employed, using brick compartments for the complete enclosure of the three high-tension bus-bars and for separating the air-brake knife-switches which are connected in series with the 35,000-volt, single-pole, double-break transformer oil-switches. All of the high-tension transformer oil-switches are located in brick compartments on the main floor. All of the oil-switches in use have given entire satisfaction and those which have had 3 yrs. continued service have received no renewal of oil. A particular feature to be commended in the recent extension of the original installation is the location of high-tension and low-tension controlling switches within the immediate reach of the switchboard attendant.

In each transmission line at the generating end is an automatic motor-operated, 35,000-volt, double-break oil-switch. These are ad-



CROSS-SECTION SHOWING GENERAL ARRANGEMENT OF APPARATUS AND SWITCH COMPARTMENTS IN TRANSMITTING AND RECEIVING TRANSFORMER STATION

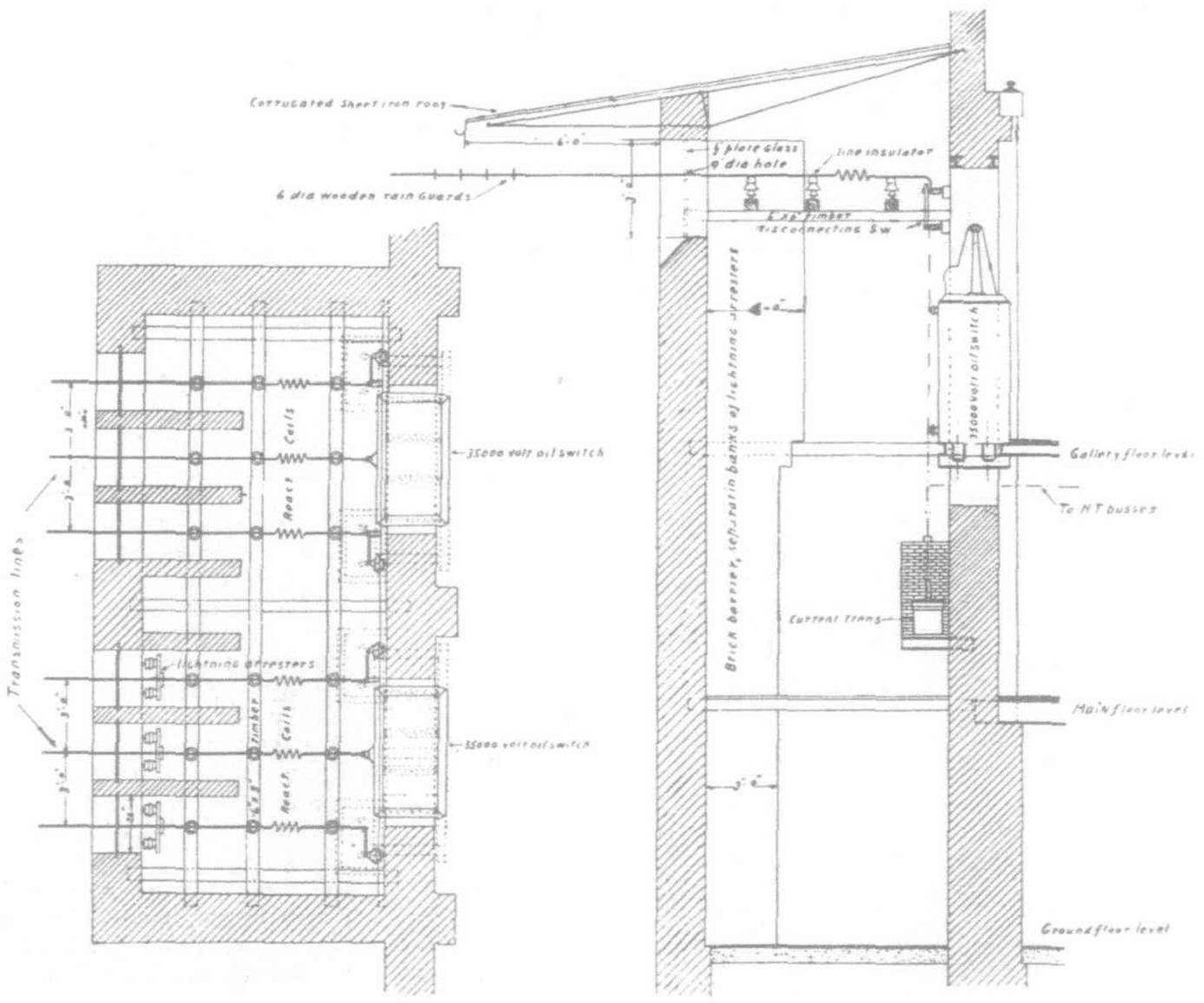
justed to trip at slightly over 100 per cent overload current by the action of an automatic bellows-type, time-limit relay. The time-limit mechanism of the latter is very simple and effective. The relay plunger, which is also the iron core of the solenoid, is actuated against air pressure by the line current. The time limit depends upon the strength of line current or overload, and the adjustment of the valve which controls the escapement of air from the receiver. With the electrically-operated oil-switches, with time-limit relays, the switching arrangement, supplemented by the use of time-limit bus-action switches at the Kolar gold field transformer station, a heavy overload or a short-circuit on one of the duplicate transmission lines actuates the time-limit relay oil-switch in the faulty line, thus switching it out of service, while the station output is carried on the other line until the fault is located. This is accomplished by the aid of a 350-kw. line-testing transformer, which will be more fully described later on. All the motor-operated oil switches are actuated by remote control switches, located on the line-control switch-panels of the low-tension switchboard.

"General Electric" Voltage Regulators.—Another, a new and valuable feature adopted in the extension to the original plant, is the use of two "General Electric" voltage regulators. Owing to the wide range of voltage to be controlled—93 volts at no load to possibly 115 volts at full load—it was found necessary to operate the two regulators in multiple; one being adjusted to the low-voltage range, the other for the higher voltage. As the load gets beyond the limit of voltage control of one regulator, the other is immediately switched into service. An increase of load tends to lower the voltage and increase the line loss. The direct-current control magnet excited from the direct-current fuses and the alternating-current magnet excited from the 2,200-volt bus-bars, acting in conjunction, tend to maintain a constant voltage at the transmitting station. This, however, is not sufficient; since, owing to a variable line loss, the desired constant voltage at the receiving station, 92 ms. distant, does not pertain. To overcome this difficulty a second winding, excited from the transmission line or high-tension buses through a current transformer inserted therein, compensates for line loss regardless of phase relation. To accomplish this it is necessary to have the requisite amount of rheostatic resistance in the shunt-field circuit of the exciters. The differential relay magnets perform the office of cutting in and out this resistance. This action depends upon the *make* and *break* of the circuit controlled by the direct and alternating-current magnets above mentioned, and through which their actuating current is obtained.

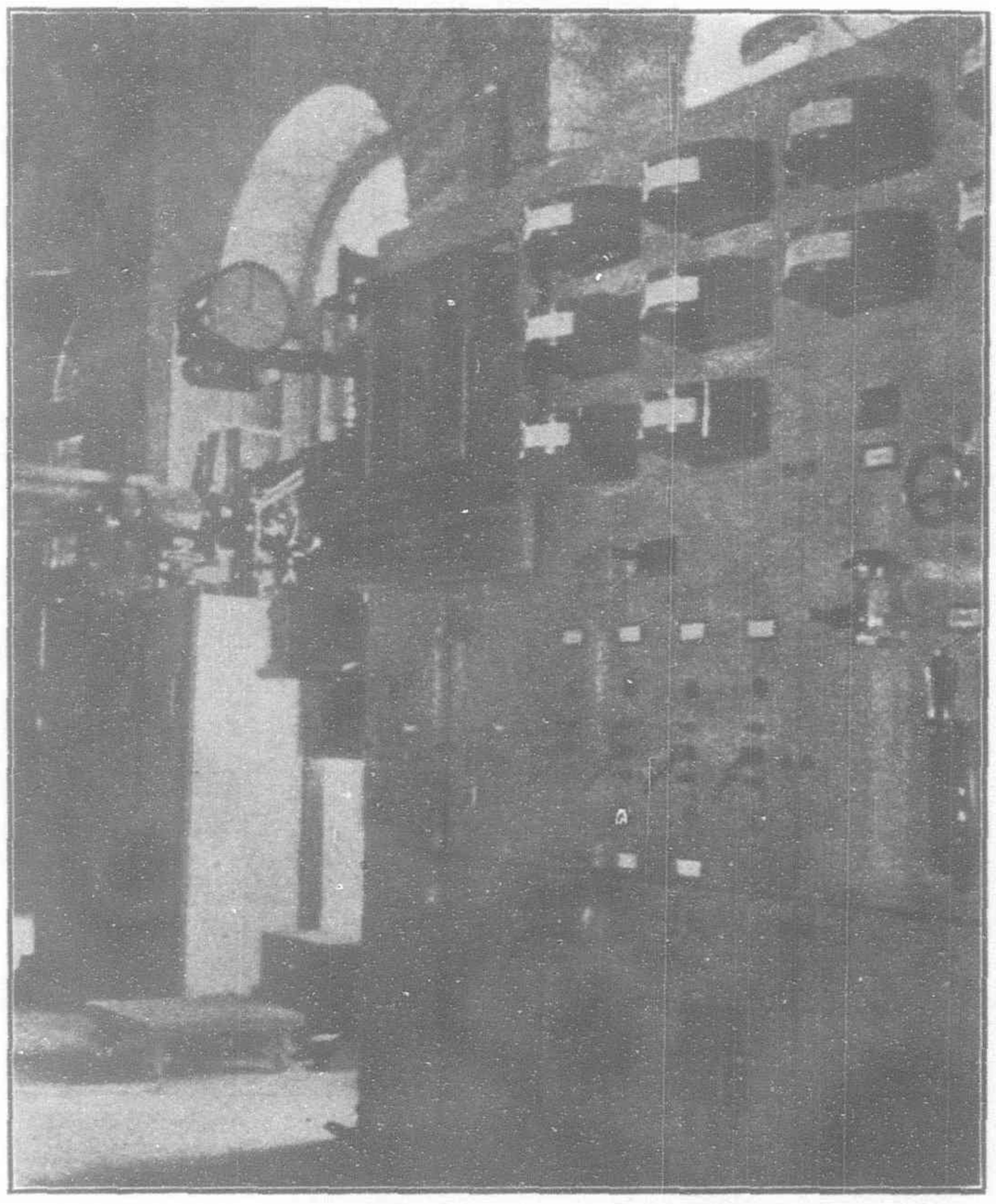
The regulator acts upon the slightest change of load and keeps the voltage constant at the distribution end of the line. Acting in conjunction with the waterwheel governors it performs a valuable service in preventing the line voltage from reaching a dangerous value when the entire station load at the receiving station is suddenly switched off for any reason. One, two or three exciters may be operated singly or in multiple on each voltage regulator.

The curves of line voltage and current from no load to full load operate at approximately power-factor 95 at the transmitting station with varying line loss conditions. Although the line voltage at the transmitting end varies approximately between 29,760 and 37,000 from no load to maximum, the voltage in the lower transformer station at Kolar remains practically constant at 29,702. Thus with both Kolar transmission lines in operation, the line loss varies from 702 volts at no load to approximately 6,000 volts at full load for power-factor 95, at the transmitting end of the line. This means a line loss of approximately 15 per cent at normal load.

Wire Towers.—Separate wire towers are annexed to the main transformer building for outgoing transmission lines, lightning arresters, reactive coils, and line disconnecting switches. Outside of the towers, 15′ from the outer wall, is an additional pole structure for anchoring re-enforcements. This method of anchorage and entrance of the 35,000-volt transmission wires has proved effective and satisfactory in every way. There is no reason why this method should not prove as effective for 60,000 volts or even higher voltage. High velocity winds and violent driving rainstorms are prevalent in this country during monsoon weather; so that this method has been subjected to very severe tests. A feature not to be overlooked is the apparent abnormal roof extension and the relative position of the rain guards, consisting of 6″ flat wooden discs, with respect to the same More trouble has been experienced with the numerous low-extension distributing lines at Kolar than with the transmission lines during violent winds and rainstorms, as regards preventing the driving rain from entering the distribution towers.



PLAN AND ELEVATION OF LINE ENTRANCE TOWER, SHOWING METHOD OF ANCHORING LINE WIRES, LOCATION OF LIGHTNING ARRESTERS AND REACTANCE COILS



VIEW OF AUTOMATIC REGULATOR AND OIL-SWITCH CONTROL PANELS, 2,200-VOLT OIL-SWITCH IN BACKGROUND, LOW-TENSION SWITCHBOARD, SIVASAMUDRAM

Reactance coils have been inserted in each phase of the transmission lines between the banks of lightning arresters and the high-tension busbars. It has been a much-argued question among electrical engineers as to whether such coils are of real value as protective devices Experience, in general, has tended to show that they are a valuable adjunct to any electric transmission plant subjected to the effects of violent electrical storms. In this particular climate during a few mos. of the yr. violent electrical storms are of frequent occurrence. During 2½ yrs. of continued service without the use of reactance coils three transformers have been damaged by heavy lightning discharges. In each instance the discharge occurred inside the top of the transformer case from one of the high-tension leads to the iron case, a distance of from 4″ to 5.″ In each case the transformer winding served the purpose of a reactance coil. The lightning arresters were adjusted to discharge at a voltage not exceeding 10 per cent above that of the transmission voltage.

Naturally the simplest remedies suggested are additional transformer insulation and the insertion of properly designed reactance (often termed *choke*) coils between lightning arresters and transformers. Since the latter suggestion has been effected, we have experienced several severe electrical storms causing discharges to earth through the lightning arresters without disturbing the operation of the plant. At this time the arresters were adjusted to discharge about 25 per cent above normal line voltage. It is a good plan to keep a check upon the action of the lightning arresters by the insertion of *tell-tale* slips of paper or thin cards between the knobs of arresters nearest the earth connection. An idea of the severity of the discharge may also be gained in this way. A slight discharge will produce a series of tiny punctures in the card which are scarcely discernible with the unaided eye, while heavy discharge will produce a single large puncture in which the edge of the whole is charred. The reactance coils herein referred to consist of a simple helix of bare copper wire one size larger than the line wire. The coils are about 6″ in diameter, having 20 turns with ¼″ air insulation between them.

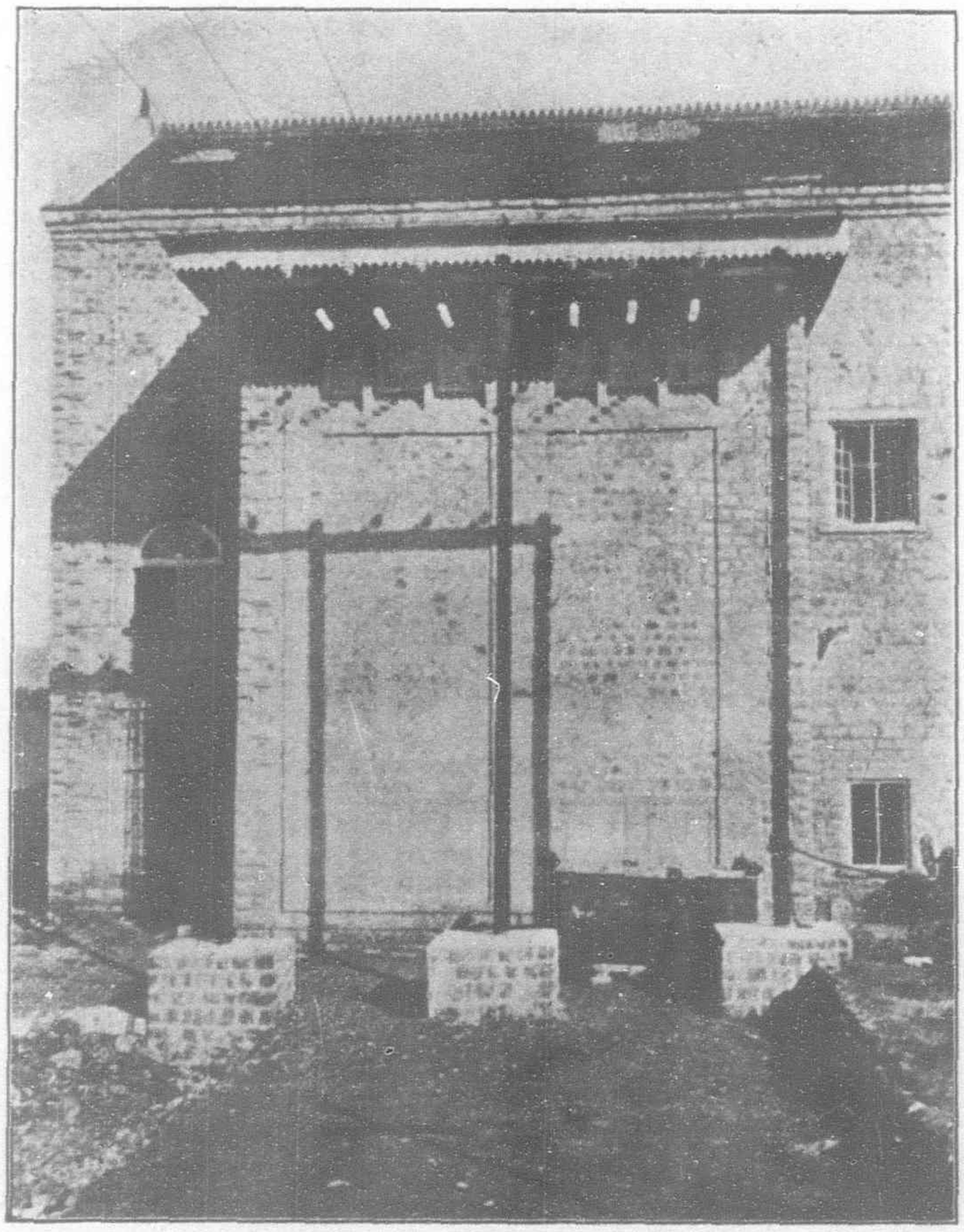
STATIC DISCHARGES.—It has been found that ordinary static discharges between brass cylinders of lightning arresters has produced a copper nitrate ($CuNO_3$) deposit in the air-gap between them to such an extent as to reduce the air-gap resistance several thousand *ohms*. This accumulation of copper salt occurs only between some six or eight of the brass cylinders located nearest the transmission wires. The deposit is probably due to the fixation of nitrogen from the air by the static discharge, and the presence of moisture with nitrogen peroxide (NO_2) results in the formation of HNO_3, the reaction of which in the presence of copper produces copper nitrate. Tinning the affected brass cylinders stops the reaction and solves the difficulty.

(To be continued.)

STEEL SCREW STEAMER "HSIN-KONG"

Messrs. S. C. Farnham, Boyd & Co., Ltd., of Shanghai, (recently reorganized under the name of the Shanghai Dock and Engineering Company, Ltd.), have completed, at their Pootung works, the steel screw steamer *Hsin-Kong*, built for the China Merchants Steam Navigation Company to the design and under the supervision of Mr. T. Weir, the company's marine superintendent. The hull is of steel, designed for the China Coast trade, and is of the following dimensions:—Length over all 280′, length between perpendiculars 270′, breadth moulded 40′, depth moulded to main deck 21′6″, height of bridge deck 7′3″, height of shade deck 7′, main to lower deck 7′, top gallant forecastle (length) 38′, bridge (length) 88′, poop deck (length) 42′. The vessel is schooner-rigged, having two steel pole masts with a complete set of fore and aft sails and awnings. Four ordinary cargo derricks and one heavy derrick capable of lifting four tons are also in the equipment. The ship is built to the British Corporation's highest class to meet the Hongkong Government survey and British Board of Trade requirements.

(Continued on page 292.)

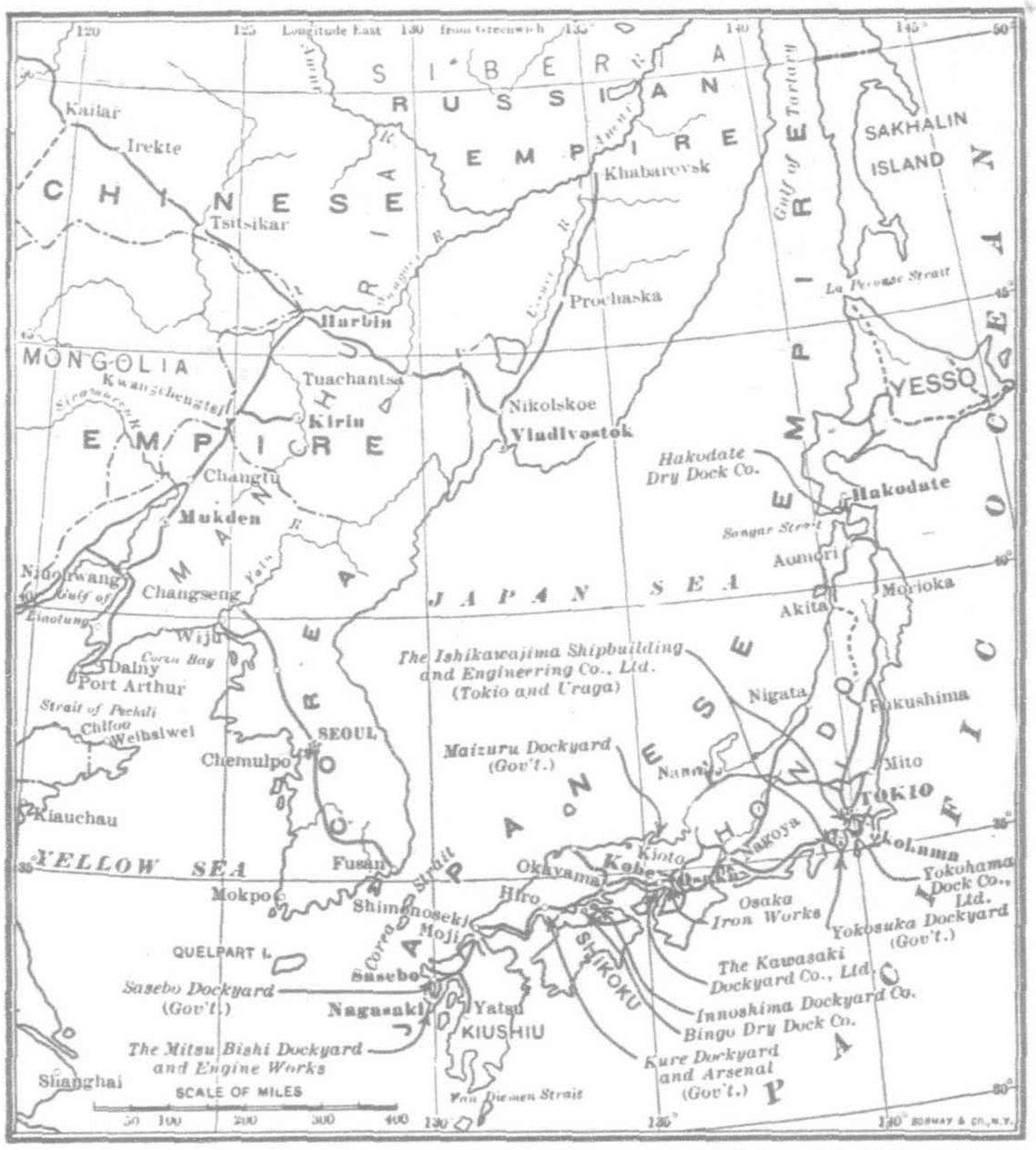


VIEW OF LIGHTNING ARREST TOWER AND OUTGOING TRANSMISSION LINES, TRANSFORMER HOUSE, SIVASAMUDRAM

EQUIPMENT AND CAPACITY OF THE DOCKYARDS AND SHIPBUILDING PLANTS OF JAPAN--II

(By CHAS. ALBERTON.)

In a previous paper, after a broad discussion of industrial conditions in Japan, the general shipbuilding statistics were given, and the government dockyards described. The present article takes up the private establishments for shipbuilding and repair work, and treats them in fuller detail.



JAPAN AND NEIGHBORING COUNTRIES, SHOWING PARTICULARLY LOCATION OF THE JAPANESE SHIPYARDS

MITSU BISHI DOCKYARD AND ENGINE WORKS.—These works are for the most part on the NW. shore of the Harbor of Nagasaki and opposite the City of Nagasaki. The pretty harbor averages about ½-m. wide, is something like 3 ms. long, and is located at the SW. extremity of Japan, which makes it a very convenient rendezvous and refitting station for all naval fleets in Far Eastern waters. The war vessels of ½-a-dozen different nations are often at anchor here at one time. Most of the Pacific, European, and other liners call at Nagasaki for coal, if for no other purpose.

In 1856 the *shogun* built a small engine works at Akunoura, importing Dutch machinery and Dutch engineers to take charge of the plant. Akunoura is on the E. end of the company's present premises and is today occupied by one of the best engine and boiler-building plants in all the Orient. The yards have a waterfront of 1½ ms., and the area occupied is about 80 acres. The original works, after serving the *shogun* government in doing repair work on very small vessels for about 10 yrs., came into the possession of the government of His Imperial Japanese Majesty, the present mikado, at which time they were greatly improved.

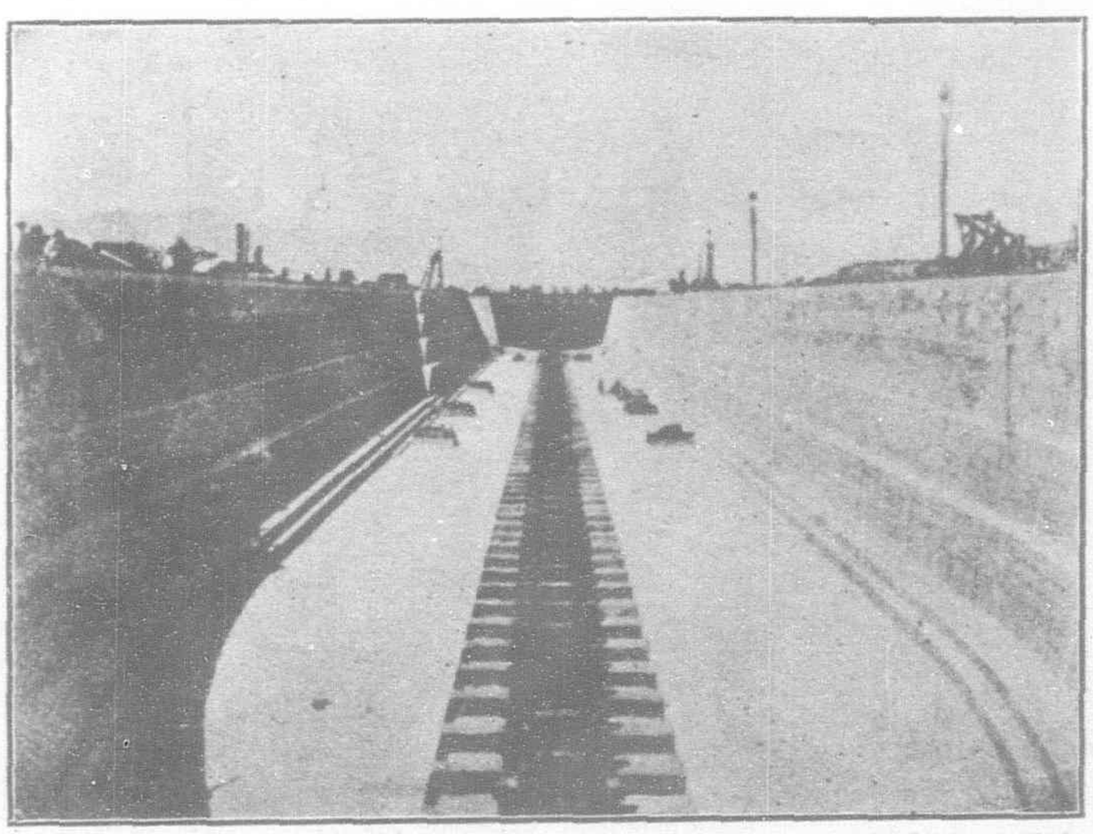
What is now the No. 1 drydock, since lengthened, was then built at Tategami, located at the W. end of the premises, and a patent slip at Kosuge, on the S. side of the harbor, owned by a British merchant, was purchased. In 1884 the entire plant was sold to Baron Y. Iwasaki and H. Iwasaki, who are the proprietors of the Mitsu Bishi Company, which, besides owning this great concern, controls other large industrial enterprises in Japan.

These shipbuilding and engine works are then the oldest in Japan. They have in use three drydocks and one patent marine slip. The big dock can accommodate the largest ironclads and merchant ships which now float the Pacific, and since these are as large as any in the world, the immense size of the new drydock is readily apparent. The company is prepared to undertake any kind of marine work whatsoever, including the heaviest, since it has lately installed the very largest and latest types of necessary machinery, has exceptional docking facilities, and is greatly extending the area covered by permanent buildings.

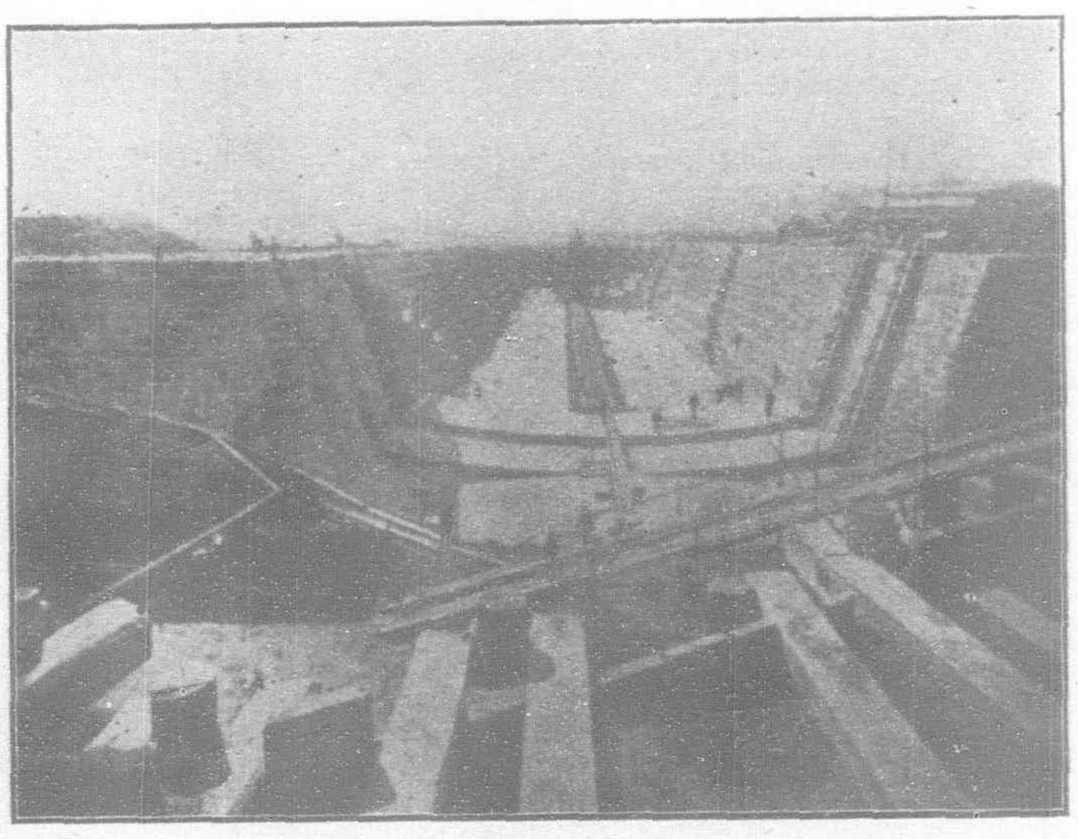
The tonnage of vessels launched from 1885 to 1894, inclusive, would scarcely average 250 tons per yr., although the company did a very large docking and repair business. Since then, however, the shipbuilding end of the business has rapidly increased and the works can now easily turn out 20,000 tons per yr. In 1895 about 2,500 tons were launched; 1898 about 8,000 tons; 1899 about 4,000 tons; 1900 about 11,300 tons; 1901 about 7,200 tons; 1902 about 15,875 tons; and 1903 about 13,100 tons. From 1885 to 1897, inclusive, the i. h. p. of engines built in the shops would not average more than 600 yearly. Since then, up to 1903, the yearly h. p. follows:—In 1898, 4,225 h. p.; 1899, 3,200 h. p.; 1900, 13,500 h. p.; 1901, 6,240 h. p.; 1902, 13,340 h. p.; 1903, 11,463 h. p.

There are on the office and yard staff about 50 men, including six foreigners. The total number of workmen employed from 1884 to 1893 started at 766 and ran up to 1,200. At the end of 1897 the number had increased to 3,800, and then remained stationary until the end of 1900. At the end of 1903 there were 5,658 men on the payroll. These figures show very decidedly the increase in capacity and business since about the time of the war with China.

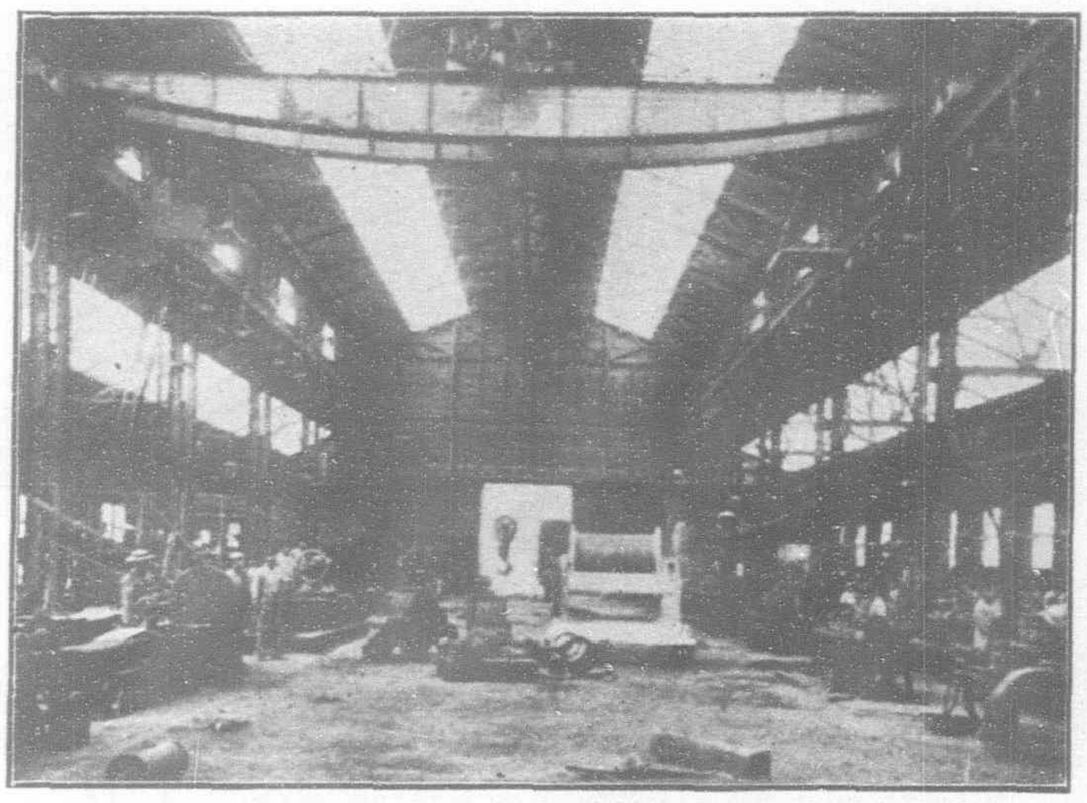
In 1898 the first 6,000-ton steamer was launched, since which time this yard has built six others just as large, six of about 2,500 tons,



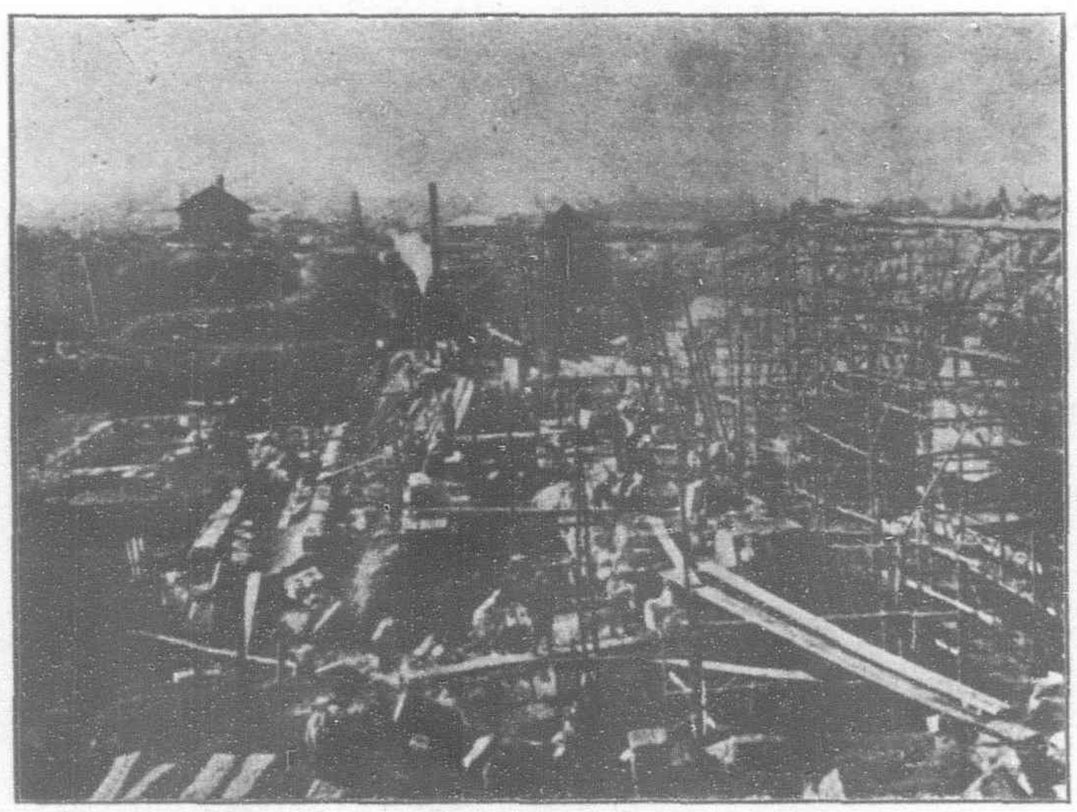
GRAVING DOCK OF THE KAWASAKI DOCKYARD COMPANY, LTD., LENGTH 426′, WIDTH AT TOP 64′, DEPTH 24′



LARGE DOCK OF THE YOKOHAMA DOCK COMPANY, LTD., COMPLETED IN 1899



MACHINE AND FITTING SHOP OF THE YOKOHAMA DOCK COMPANY, LTD., SHOWING HAULING WINCH FOR SLIPWAY



NO. 2 DOCK AND PUMP HOUSE OF THE YOKOHAMA DOCK COMPANY, LTD., IN COURSE OF CONSTRUCTION, 1896

six of about 1,600 tons, besides a half-dozen smaller ones. They have built for the Imperial Japanese Navy one 120-ton torpedoboat and two each of 80 tons, the government furnishing the materials. They have also constructed two dredges of 500 gross tons each for the Wakamatsu harborworks, and a large number of small craft of various types from 100 to 300 tons. The company is proud of the twin-screw steamship *Aki-maru*, of 6,443 gross tons and 5,448 i. h. p., now belonging to the Nippon Yusen Kaisha and ordinarily in service on the American line running to Seattle; also the little steam yacht *Hatsukaze* of 80 tons gross and 200 i. h. p., built for the use of the crown prince and launched in 1902. Japanese art has figured largely in the trimmings and furnishings of these ships and the result is unique as well as highly satisfactory.

The dimensions of the three drydocks, all of which are faced with granite and built in solid rock, are as follows:—

	Length on keel blocks	Top entrance width	Bottom entrance width	Depth of water on blocks at spring tide
No. 1 Dock	510′	89′	77′	26′6″
No. 2 Dock	350′	66′	53′	24′
No. 3 Dock	714′	96′7″	88′7″	34′6″

The patent marine slip owned by the company has a length of rail of 750′, width between rails of 30′, and it is capable of taking vessels weighing up to 1,000 tons.

The company is prepared to undertake extensive salvage operations, having built especially for this purpose the steamer *Ouramaru* which is 186′ long, 29′ beam, 16′ depth, and 712 tons gross. She is fitted with four centrifugal pumps, three pulsometers, and one special pump, is capable of handling 2,000 tons of water per hr., and is equipped with a large electric-lighting plant so that salvage operations may be carried on both night and day.

In order to obtain enough satisfactory men, the company conducts a school which has been in operation for 5 yrs. This school is carried on in a handsome 2-story brick building built for this especial purpose. They teach five classes of boys, in all about 250. About 50 boys enter each yr., besides 100 apprentices who are given lessons in the morning before going to work. In March, 1904, 22 boys graduated and entered the different departments as apprentices for a term of 5 yrs. As showing the attitude of large works to the outside public, it is interesting to note that this school is free to any one who cares to enter.

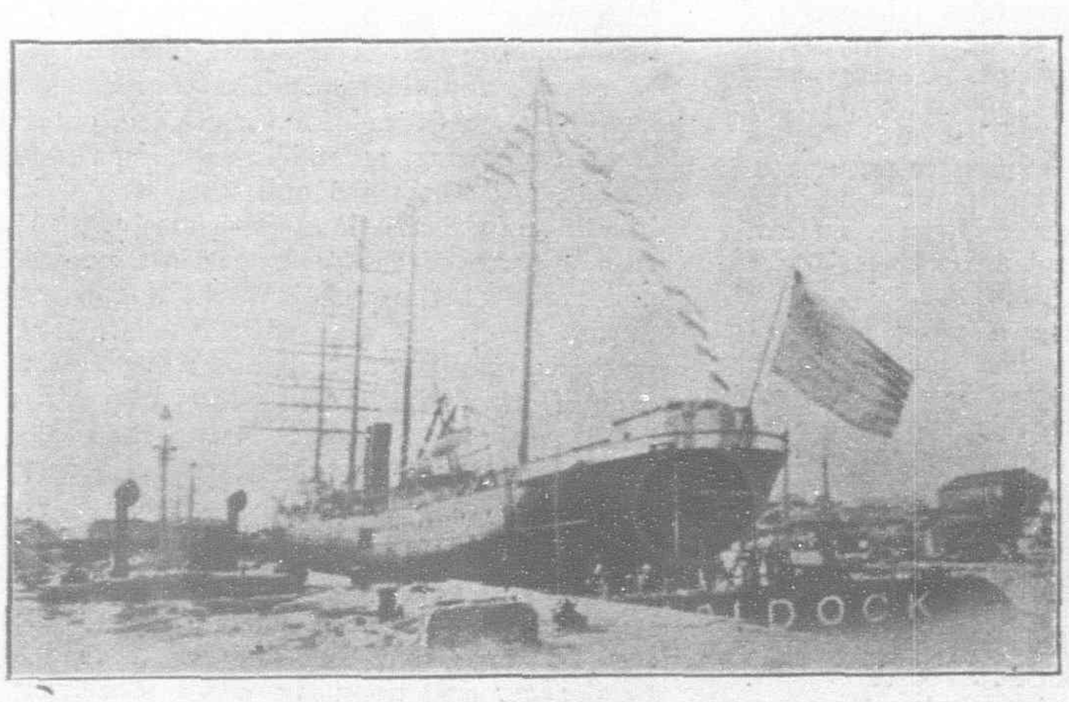
The company has built a hospital where it maintains a corps of physicians to treat the employees of the company free of expense. It has accommodations for 50 patients at one time.

The company also owns its own water supply. That it is liberal in the treatment of its employees is shown by the further fact that since 1897 it has had in operation a combined pension and insurance system. To this fund each employee makes a monthly payment, while the owners contribute an equal amount. The benefits range from -Y-50 to -Y-2,500, according to the standing or position of the employee, and are given to the families of those who are either injured or die at the works. Those who retire from old age receive a pension. A savings bank system is also in operation. Each employee who so desires deposits -Y-1 on each payday, on which the company pays a liberal rate of interest. When the principal and interest reach -Y-300 the company then adds -Y-50 to the amount and another account is opened.

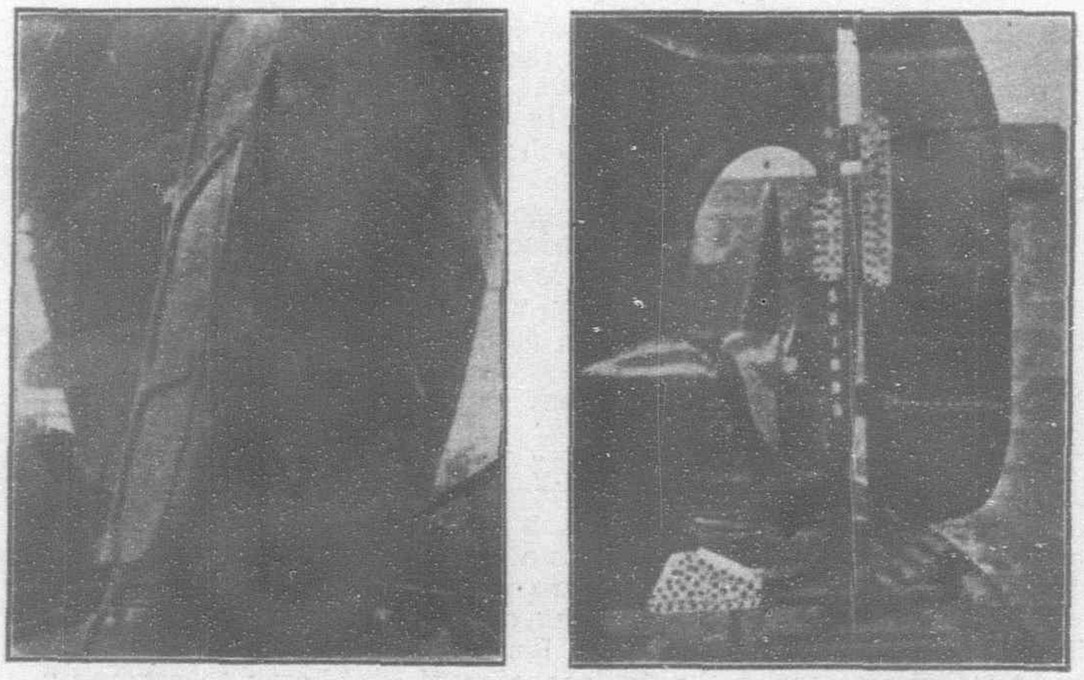
On the premises the company has erected a clubhouse for the use of its officials and foremen. It is fitted with billiard tables and various games. Lunch and light refreshments are served at any time. The reading room is supplied with reading matter consisting mostly of engineering and naval works, text books, and current technical journals. Upon the beautiful hillsides back of the works and overlooking the harbor there are about 20 official residences for such of the high-class employees as care to occupy them. It will thus be seen that this company takes an interest in about everything that pertains to the welfare of its workmen.

KAWASAKI DOCKYARD COMPANY, LTD.—This company has extensive grounds and a lengthy waterfront on the W. side of Kobé Harbor. The City of Kobé is located near the entrance of the celebrated Inland Sea of Japan, on the NW. shore of Osaka Bay, and only a little S. of the center of Japan's E. coastline.

As showing the type of men who are now entering shipbuilding and other industrial works in Japan, it is worthy of mention here to note that the president of the company, Mr. K. Matsukata, is a son of Count Matsukata, the father of Japan's present financial system and who is a trusted adviser of the emperor. To find a man of this type engaged in business

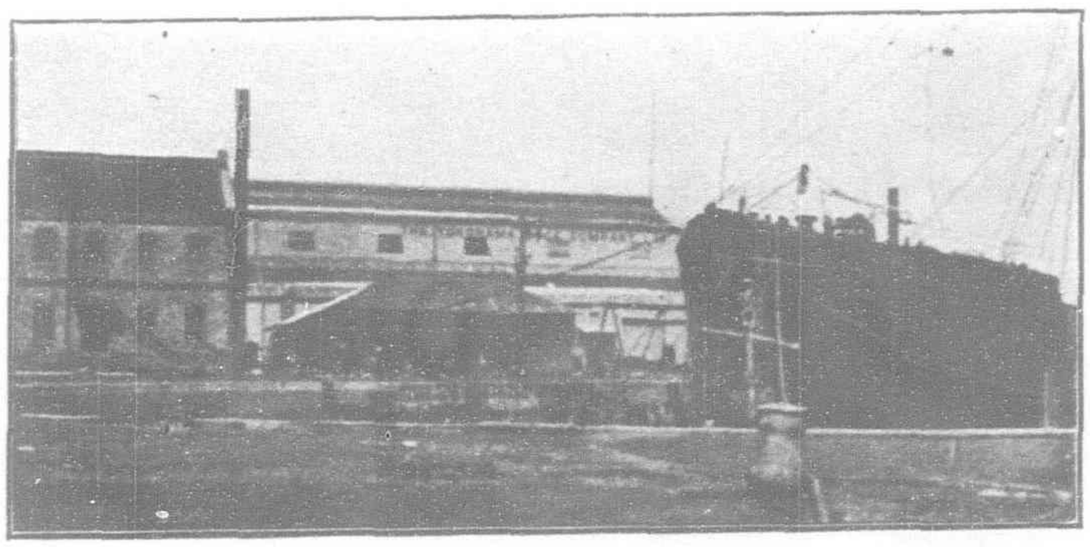


STEAMSHIP *CITY OF PEKIN* IN LARGE DOCK OF THE KAWASAKI DOCKYARD COMPANY, LTD.

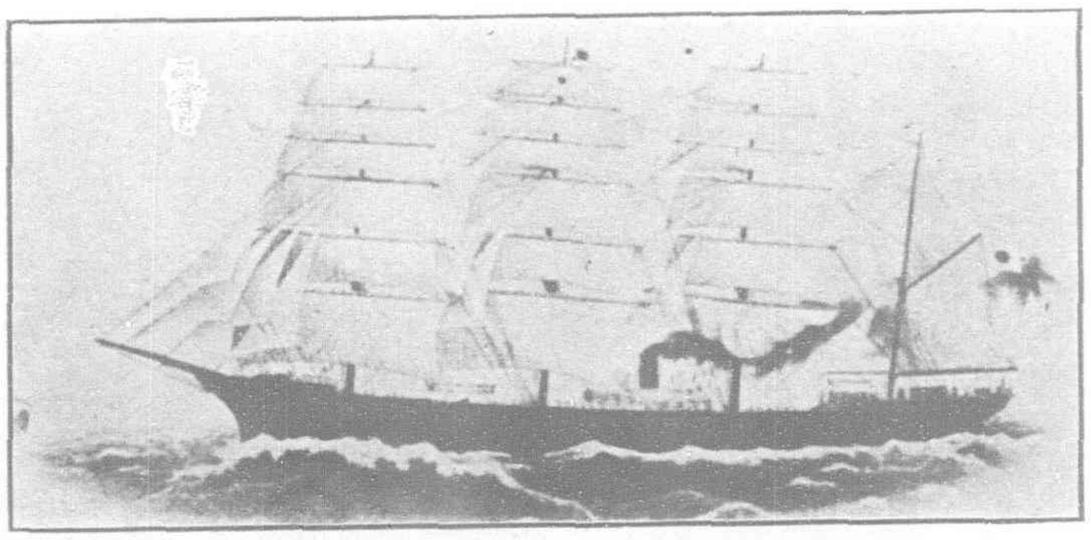


STEAMSHIP *KHALIF* IN YARD OF THE YOKOHAMA DOCK CO., LTD.*

*On the left she is shown with stern Frame and Rudder damaged in typhoon, and on the right, with temporary repairs, with which she steamed full speed to Cardiff, Wales.



PART OF THE YARD OF THE YOKOHAMA DOCK COMPANY, LTD., SHOWING BOW OF VESSEL IN THE BIG GRAVING DOCK



TRAINING SHIP *TAISEI-MARU*, BUILT BY THE KAWASAKI DOCK-YARD COMPANY, LTD., USED BY NAUTICAL SCHOOL OF TOKYO

enterprise only goes to show the immense change that has taken place on Japan within the last 40 yrs. Previous to that time the better class Japanese would have nothing to do with business and the merchants were not looked upon with favor. At the present time the change is complete and business is an honorable profession with men of all rank. The coming of the higher class Japanese into business has brought in the much-needed higher ideals as to commercial methods and honesty.

In order to keep posted on the best designs, tools, and manner of working in Europe and America, the officials of this company send every yr. in regular rotation one of their engineers to study what is being done. Besides this the management occasionally sends some of the executive members to study up this side of the business. The company is a thorough believer in the ability of the Japanese to do things and hence does not employ foreigners in any capacity. Like all the other large drydock companies, it buys only the best material, and the management and engineers insist on turning out good work.

While Kobé is not the home port of any large steamship lines, all the steamers, both from Europe and America, including cargo and passenger steamers, make Kobé a port of call. This port has therefore the largest tonnage of any harbor in Japan, and naturally the shipping interests are very large. This makes an ideal location for dockyard companies.

The Kawasaki Dockyard Company, Ltd., is the largest in operation in Kobé at the present time, next to the largest in Japan, and is engaged in shipbuilding, repairing and general engineering work. The Japanese Government, being paternal in its rule, early started to establish various industries, and shipbuilding was one of those thus helped. As these industries developed and no longer needed governmental care, they were turned over to private companies to operate, and so it came about that this establishment was sold to Mr. Shozo Kawasaki some time in 1886, after having been started by the government in a small way during the '70s. In 1896 the present stock company was organized, taking over the whole works and capitalizing them at -Y-2,000,000, which was fully paid up. Since then the company has issued, mostly taken by the original stockholders, another -Y-2,000,000, of which only part has been taken up. Although nominally a registered company, it is practically a close corporation, since the majority of the stock is held by a few influential men. The company regularly pays a dividend of 12 per cent on the stock, and has issued bonds at two different times, each issue being -Y-1,000,000, bearing 9 per cent and 7 per cent interest.

The company has nine shipbuilding berths and the necessary machinery for laying down and building vessels of various lengths up to 600′ and 7,000 tons gross. It also has a splendid drydock, described below, and two patent slips, the larger of which is 600′ long on the rail and will take vessels up to 280′ long and about 2,000 tons gross, while the smaller one is 400′ long on the rail and will take vessels up to 180′ in length. The present and proposed buildings, of which there is an ample number for all purposes, are some of them large size, and all the buildings now being erected are either of brick or skeleton steel framework with galvanized roofing and sides. They are being located and arranged so that they can readily be extended as the business increases.

Outside of its regular shipbuilding, docking, and repair work, the company has made boilers of various sizes and types, including eight Miyabara watertube boilers for H. I. J. M.'s cruiser *Hashidate*, marine and land engines, direct-connected centrifugal pumps, engines, tanks, steel pipe, etc. It also has in operation a special department for the manufacture of shells for the small guns of the imperial defense. It has a good-sized salvage steamer built by itself, fitted with powerful electrically-driven pumps, driving apparatus, derricks, and all other necessary gear. On the grounds is a small dispensary fitted with first-aid appliances, while a regular physician is always within call.

The management is very progressive, and the company was the first in Japan to build vessels for export. It points with pride to the pioneer export ship, the steamer *Liu Hsing*, a lighthouse and buoy tender, built and engined complete for the Imperial Chinese Maritime Customs at Shanghai. This vessel is fitted with twin screws, triple-expansion engines of 1,300 i. h. p., electric light, and all other modern appliances. The gross tonnage is 750 and the speed 13 knots. She is 185′ long, and was completed in June, 1902. The Kawasaki company has also built a small river gunboat for the Chinese Government, a lighthouse tender which will carry a couple of light guns for the Korean Government, and a steam launch for the Siamese Government.

The growth of the works will be shown from the fact that in 1898 the tonnage of the ships launched was about 1,000, having engines of 1,200 i. h. p., while there were employed at the works about 1,800 men. In 1902, 8,500 tons were launched, with engines of 11,000 i. h. p., and the number of employees was about 3,500 In all the company has built about 50 vessels, the largest to date being about 2,300 tons gross.

The power used throughout the works is entirely electrical. The large machines throughout the works are run by individual motors, while the small ones are run in groups. The management has decided to install an 800-kw. steam turbine unit. The company has also in use what is probably the most expensive pneumatic outfit in the empire. This plant and the various tools were imported from America, where the management sent an engineer to be thoroughly instructed in their use.

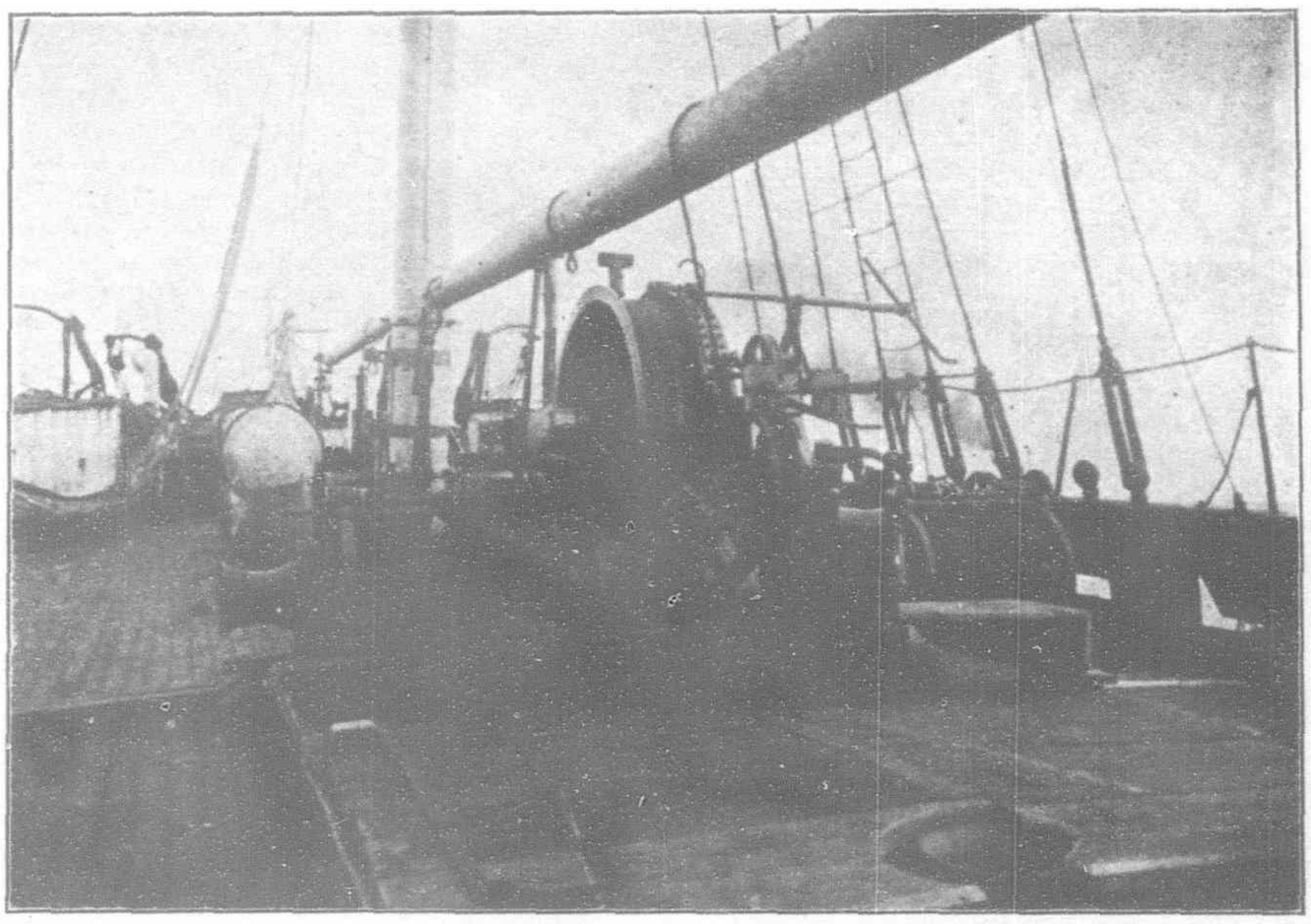
The company also has a very powerful hydraulic plant for flanging, joggling, and forging, which was imported from England. This was the first dockyard in the empire to install a cast-steel plant, and for some time past it has been using cast-steel wherever necessity called for light weight combined with strength, such as frames for engine in torpedoboats, and has had very good success in this line of work.

The shipping conditions in Kobé Harbor began to demand a drydock in the early '90s. The Kawasaki dockyard people therefore prepared to meet this demand, and upon making an examination of the strata underlying their property, found that they would have a very difficult piece of engineering work in order to successfully build a drydock. Test borings showed that under the top layer of sand there was a layer of silt some 25′ thick, beneath which were other layers, mostly sand, all evenly charged with water and evidently connected with the sea. The opinion was freely expressed among the foreign engineers living in the vicinity that the dock could never be built at the site selected. The dock was however officially opened in June, 1902, having been about 5½ yrs. in building. Since then it has been occupied almost continually and remains as when built as tight as a drum and as dry as a bone.

The dock complete with pumping outfit cost about $850,000. The American, German, Austrian, British and other governments have had their war vessels in this dock, which is also patronized by all the European, Australian, American and Japanese steamship lines whose vessels call at Kobé. Its dimensions are as follows:——Length, caisson to toe of head wall, 426′; length on floor, 392′; width of entrance at top, 64′; width of entrance at bottom, 52′; depth of sill below high water, spring tide, 24′.

As illustrative of the manner in which the Japanese Government makes use of the industries in the empire which may be of assistance to it, the following is of interest:—All the larger warships of the Imperial Japanese Navy have been imported, principally from England, and until lately most of the smaller vessels were also built abroad. Torpedoboats and torpedoboat destroyers were often sent for repairs to the larger and best equipped of the private dockyard companies, which in this manner became more or less familiar with the construction of these little fighting craft. Later on torpedoboats and torpedoboat destroyers were ordered from abroad, but were shipped knocked down to Japan, and sent with the erecting drawings to the few of the private dockyard companies, including the Kawasaki, for erection. The companies thus had the benefit of the experience obtained; first in repairing, second in erecting the small vessels, and the third and final step was the building of these little craft themselves. These two or three of the dockyards are now doing and some of the vessels so built saw service during the recent war with Russia. By this method Japan is gradually absorbing the knowledge of other nations and taking into her own hands work of all kinds as fast as she is able to equip herself to undertake it.

YOKOHAMA DOCK COMPANY, LTD.—Yokohama is situated upon the W. shore of Tokyo Bay and in order to protect its shipping the government has made a good harbor by building an extensive breakwater. Within this breakwater and upon the city's shorefront, is located the property of the Yokohama Dock Company, I,td., which is therefore accessible in all kinds of weather.



CABLE-LAYING DRUM MADE AND FITTED TO THREE STEAMERS BY THE YOKOHAMA DOCK COMPANY, LTD.

Before there were any graving docks in Yokohama, the old Mitsu Bishi Steamship Company owned a small repair works there. When the Mitsu Bishi Company was absorbed by the Nippon Yusen Kaisha, in 1885, the latter of course took over the repair works, but desiring to confine its attention to its growing shipping business only, it sold the repair works to the Yokohama Dock Company, Ltd., in 1896. This yard differs from some of the others in Japan in that it was not started, and has not been assisted by the government.

Although this company is engaged largely in doing repair work, yet it builds small towing boats, yachts and launches, lighters, land and marine boilers and engines, steel frame buildings, etc. In 1903 the company erected steel framework amounting to 400 tons, and generally finds this class of work profitable. In 1904 there were on the premises 19 buildings and 11 sheds, 11 of which were brick, one steel frame, and the rest stone.

Yokohama is either the terminus or home port of almost all of the many lines running from Europe and Australia *via* S. Asia to China and Japan. It is also the beginning and end of all the great Nippon Yusen Kaisha's schedules, with the exception of the American line. All the big and little Transpacific steamers call at Yokohama as well, so it was an excellent location for much-needed docks.

The present company started operations in 1896. Its small dock was opened in 1897 and the large dock in 1899. The works were started with the idea of docking and doing repairs only and this has been largely continued to the present time. They are the result of a desire, on the part of some of the shareholders of the Nippon Yusen Kaisha and of some influential Yokohama men, to have ample facilities for docking vessels at Yokohama. Previous to the opening of these docks the most available place for repairs in this neighborhood was at the government docks at Yokosuka, but these were available only by obtaining special permission and in case of extreme necessity.

The area of the works is 37,624 *tsubo*, or 1,354,464 sq. ft. The waterfront has a length of 3,104′. In the dredged passage or basin in front of the docks there is a depth of 36′ at high water, but in the harbor outside the basin it is not so deep, although this is now being deepened. The larger part of these works was built on reclaimed land with the understanding that the property was to belong to the company when the reclaiming was properly done.

In all the company has on the payroll about 1,000 employees, of which a fair number are apprentice boys. Usually the different grades of men are trained in the works, although occasionally some are obtained from the smaller yards with which Japan abounds. Probably 15 per cent of the present help has come from other works, and a less proportion than this drifts away either to start in business for themselves or to work in other shops. At this yard, as in all Japanese yards, it is difficult to secure in a hurry any exceptionally large increase in employees, although a floating number up to 15 per cent of the present number is usually readily secured.

Here, as elsewhere, there are no regularly organized labor unions, but the old time customs, which are very powerful and sometimes deeply felt, have to be regarded very carefully. Ordinarily, however, the workmen are fairly just in their requests and are not troublesome. They feel that they belong to the company and to its officers. In fact one might almost say that they feel that a part of the company belongs to them. Really they seem to take pride in being part of the works, which increases with the length of their service, and this feeling is not without reason, because the men are kindly treated and seldom discharged even when work gets scarce. When once discharged there is difficulty in getting them back again. Here, as everywhere and in every condition in Japan, the old feeling of master and servant still remains to an extent so much greater than in America, that it is hardly appreciable by Americans.

The men show an adaptability in changing from one kind of work to another, otherwise on repair work the company would not be so successful. Those, however, who work on machine tools are kept there permanently. It is the established policy of the company to substitute labor-saving machines for hand work wherever possible, since it considers these both quicker and cheaper than the best labor obtainable, the price of which is rapidly rising.

A floating derrick of 35-tons capacity is in use along the waterfront, while a system of light railway facilitates transportation of materials among the buildings. A branch of the Imperial Government Railways runs into the yards and is connected with a system of tracks reaching all the main buildings. The buildings thus reached are served by a 6-ton traveling crane.

A wet dock without gates is now in process of construction for enabling deep-draft vessels to be moored at the works. This will be built on property now owned by the company and will be 500′ long, 160′ wide, and 30′ deep at low water, and will take about 2 yrs. to complete. The company has in operation two drydocks and one small marine slip, which is used mainly for tugs, launches, and other small craft. The larger drydock has an inside length of 514′, and the other, of 375′.

The largest vessels docked have been *Inabamaru* and other European liners of the Nippon Yusen Kaisha, these being rated at abou,. 6,200 tons gross, and having a length of 449′t beam 49′9″, and depth 30′6″.

ISHIKAWAJIMA SHIPBUILDING AND ENGINEERING COMPANY, LTD.—This company has in Tokyo a wooden graving dock, and besides shipbuilding has a considerable trade outside the regular marine line of work. It has never built any large ships, but all told has launched something like 125 vessels, mostly of wood. Thirteen thousand tons gross will cover the output. In 1902 the company amalgamated with the Uraga Dock Company, Ltd., and the combined works are now in position to build ships of large size. The Uraga property is near the entrance of Tokyo Bay and is conveniently located for the large ships making Yokohama or the smaller ones making Tokyo There are two docks at Uraga, one having a length of 497′ and a depth of 26′, and the other a length of 471′ and a depth of 24′6″.

Either dock can be emptied in 3 hrs. Warships belonging to the governments of the United States of America, Germany, and Austria have been docked and repaired here. These yards have several shipbuilding berths and all the necessary machinery for the building of large ships, besides the equipment necessary in the docking and repairing of ships.

OSAKA IRON WORKS.—These works are located near the mouth of the Aji Kawa (Aji River), which flows through Osaka and into Osaka Bay through the new Osaka harborworks. The business has been gradually increased until now the works occupy about 20 acres of land, with a waterfront of about 2,000′.

Up to the present time the yards have turned out about 200 ships, a little less than ⅔ of which are very small wooden ships, the balance being steel. In this number are included several light-draft steamers for freight and passenger service on the short and shallow Japanese rivers. Under the subsidy act and since 1900 the company has built, engined, and launched several steel steamships having a tonnage of 8,000 tons gross and 7,000 h. p.

There is one 250′ drydock in operation, two more are projected, and the company possesses the usual equipment for docking and shipbuilding, together with that required for such work as usually comes to an ironworks. At the present time it is impossible to turn out large vessels, since the river is only 14′ deep, but when the harborworks are completed and river will be dredged and the works will be equipped to build larger ships.

The company does a great deal of outside work, including castiron pipes for waterworks, bridge and steel framework, complete concrete-making plants, and bucket dredges for the rivers and harbors of Japan having a capacity of from 100 to 400 tons per hr.

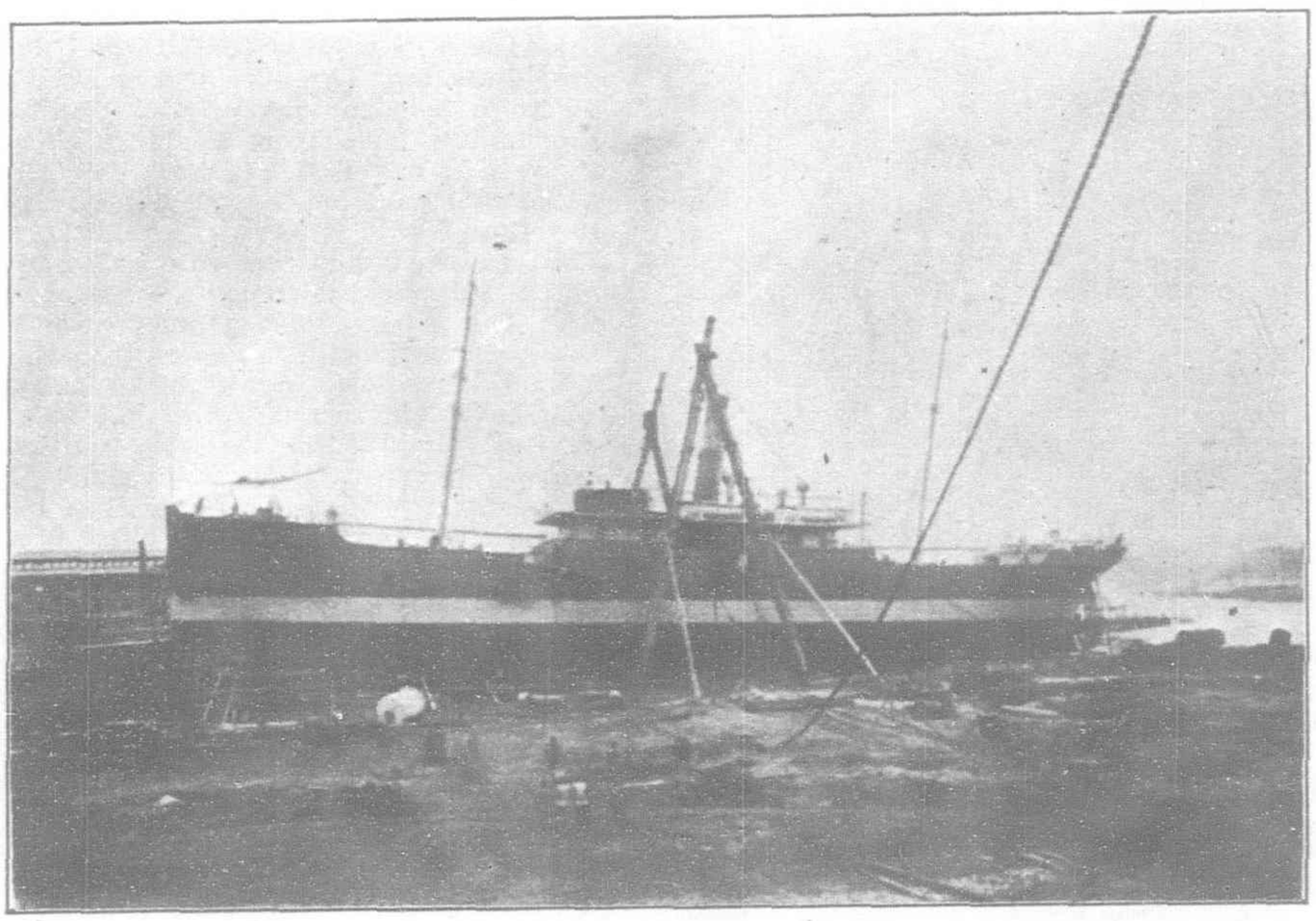
HAKODATE DRYDOCK COMPANY.—This is the northernmost of the Japanese dock companies and is located at Hakodate on the S. shore of the Island of Hokkido. The works started first with a patent marine slip having rails 520′ long, and capable of lifting vessels up to 1,400 tons gross. With the increased shipping interests in that section these facilities were inadequate and the company has recently finished a new granite drydock 534′ long at the top, 82′ wide at the top, and 72′ wide at the bottom, with 30′ of water on the sill at spring tide. This is not a shipbuilding company. The equipment owned is sufficient for light repairs only.

INNOSHIMA DRYDOCK COMPANY.—This company builds wooden junks and does ordinary repair work on medium-sized steamers. It is located on an island near the center of the Inland Sea and has two drydocks cut from the solid rock. The larger dock is 357′ long on the bottom, 50′ wide at the top, and 44′ wide at the bottom, with 20′ of water on the sill at spring tide. The other dock is used for light-draft interisland trading vessels which are usually docked two at a time, and is 300′ long.

STEEL SCREW STEAMER "HSIN-KONG"

(Continued from page 287.)

GENERAL PLAN OF THE SHIP.—The vessel is divided into seven watertight compartments, comprising the machinery space which is amidships, three cargo holds, two water-ballast tanks, which are also arranged to carry cargo, and fore and aft peaks. The whole of the 'tween decks, before and abaft machinery, which extends the full width of the ship, is available for cargo, having four hatches with cargo stages in hold, eight cargo ports, and every facility for the rapid handling of cargo.



STEAMER *HSIN-KONG* BEFORE THE LAUNCH

The main and lower decks are of steel throughout. The poop, bridge, and forecastle decks are sheathed with teak and the shade deck over bridge with Oregon pine, having teak covering boards enclosed by iron railing.

A bulwark 3′ high is carried up between top-gallant-forecastle and bridge, and between poop and bridge, in which are fitted eight cargo gangways. On the main deck three steam-whipping winches and one horizontal winch, by Messrs. Clarke, Chapman & Co., Ltd., are arranged alongside the four hatches, the latter being fitted for manœuvering the ship to wharves.

A powerful steam windlass and capstan combined, by the same makers, is fitted on the top-gallant-forecastle for working Hall's patent stockless anchors and the speedy manœuvering of the vessel, with appliances for rapid mooring. The forecastle is fitted up for the crew and firemen and the lower forecastle for the petty officers and stores.

The accommodation in the bridge is arranged for 40 2d-class Chinese passengers, two berths in each room; chief compradore's room, two galleys, and scullery and water closets. The poop has 44 open berths for 3d class Chinese passengers.

Accommodation for 1st-class passengers is fitted on the bridge deck and consists of a saloon which is tastefully panelled in cedar pine with hardwood pilasters and painted white and gold, three staterooms, pantry, gallery, scullery, storeroom, bath and water closet; also rooms for the chief mate and the chief engineer forward, and for 2d mate, 2d and 3d engineers, mess room, bath and water closet, steward, steward's store and boys aft.

On the shade deck the captain's room and wheelhouse are fitted with four lifeboats. The dinghy and cutter are housed in the poop. A set of steam steering gear, by Messrs Caldwell & Co., Ltd., is fitted in the engine-room and operated from wheelhouse and flying bridge, and the screw steering gear, by Messrs. John Hastie & Co., Ltd., is fitted aft on the poop.

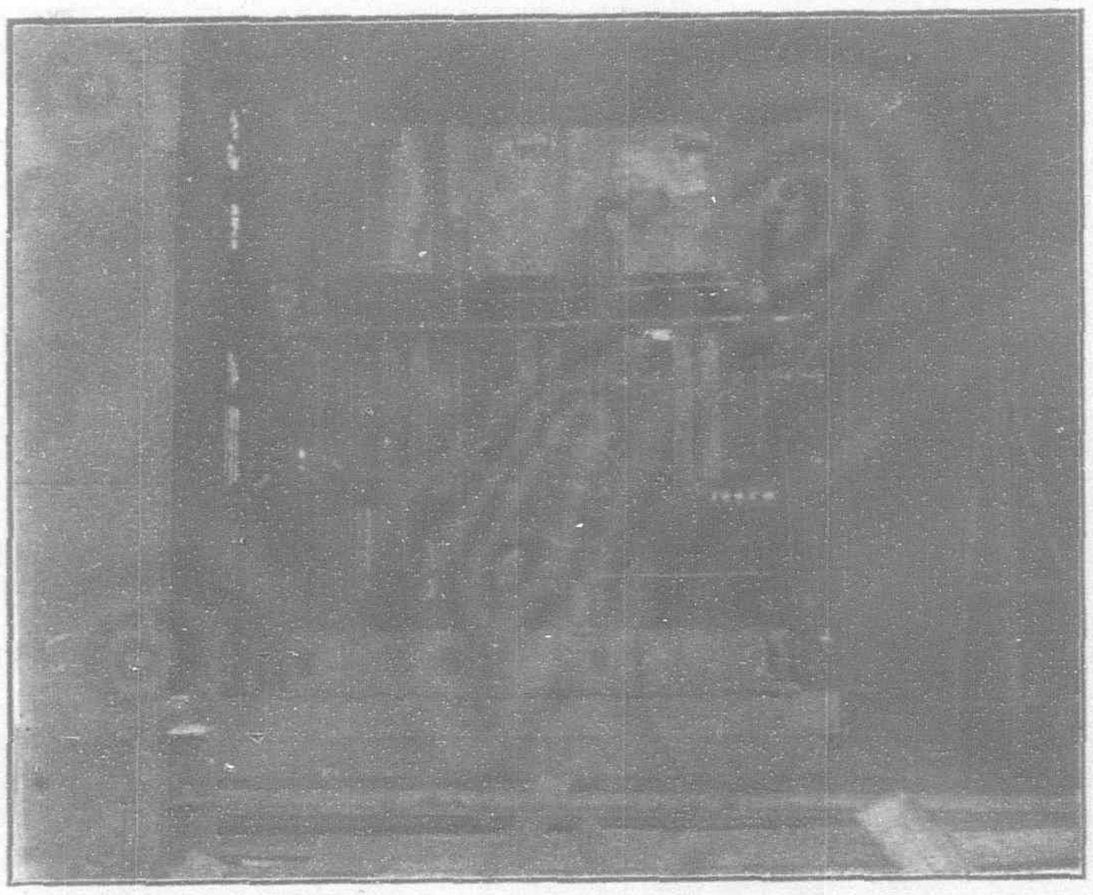
There is a complete installation of electric lights throughout the vessel on the double-wire return system, consisting of 162 lights, including masthead, side lights, and four cargo clusters. The dynamo and engine, by Messrs. Clarke, Chapman & Co., Ltd., is fitted in the engineroom.

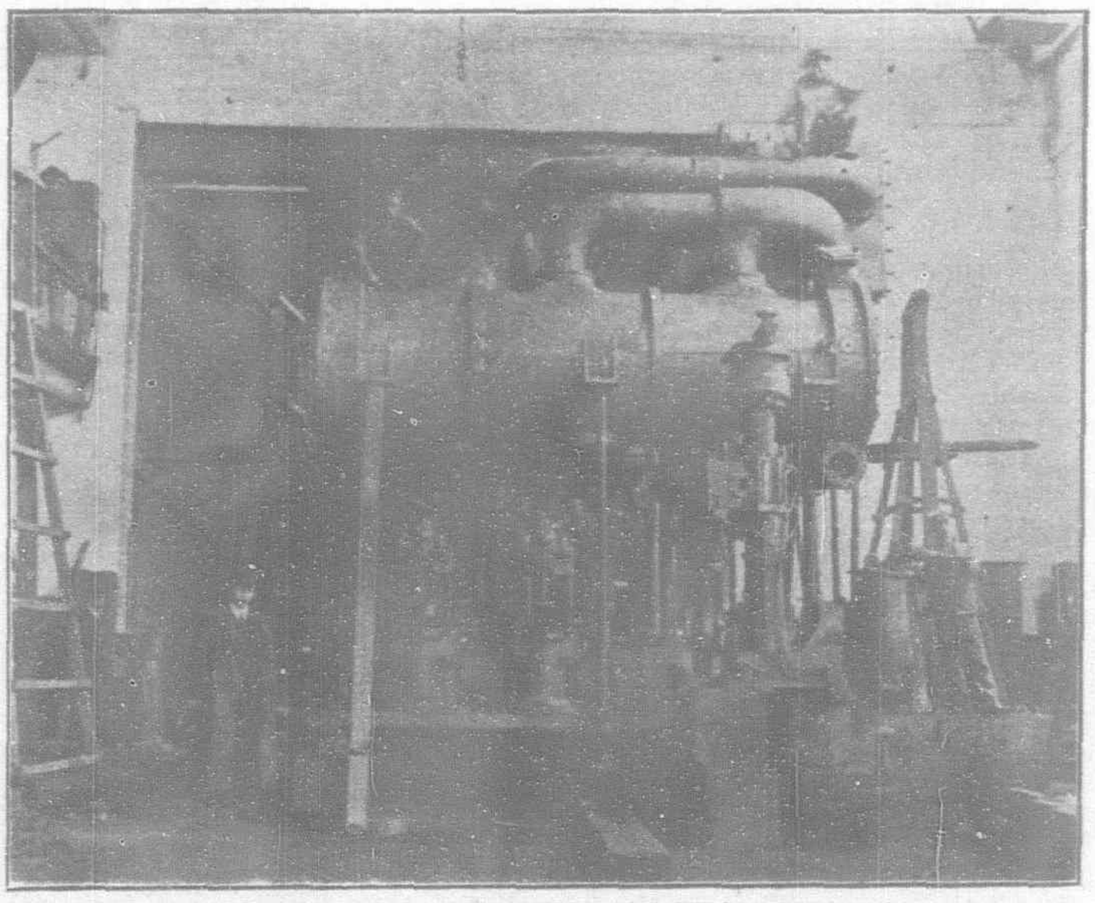
The deck fittings and equipment are most complete and include water service which can be used in case of fire, steam-heating ventilators, skylights, sidelights, accommodation ladders, etc.

PROPELLING MACHINERY.—The propelling machinery consists of one set of triple-expansion, surface-condensing, direct-acting engines, having cylinders 19½″, 3 1¾″, and 52″ diameter by 36″ stroke, and designed for a working pressure of 160 lbs. per sq. in. Steam is supplied by two large cylindrical return-tube steam boilers, 14′ diameter by 10′6″ long, designed for a working pressure of 160 lbs., and tested at 320 lbs. per sq. in. The main engines, built by Messrs. S. C. Farnham, Boyd & Co., Ltd., embrace all the best features of modern design, including cast steel conical pistons, expansion levers to each set of valve gear, "all round" steam reversing gear, easy means of access and overhauling, and large bearing surfaces. The cylinders rest on mild steel turned columns, back and front, with condenser supported at back and are arranged to suit Messrs. G. & J. Weir, Ltd., "dry air" pump installation, which is the first fitted in the Far East. It possesses many advantages, not the least being the removal of all pumps from the main engines and the consequent absence of pump levers, etc. In this case the pump is placed on top of a centrifugal pump cylinder and is driven by a continuation of the pistonrod. Immediately below the condenser are two vertical single-cylinder pumps for drawing off condensed water and discharging to Weir's "direct contact" feed header, which a pair of Weir's boiler feed pumps discharge to the main boilers.

PUMPING ARRANGEMENTS.—The centrifugal pump for circulating water through the condensers is of Messrs. Drysdale & Co.'s make and is driven direct by a single-cylinder vertical engine, a large steam ballast pump and a steam sanitary pump of Messrs. G. & J. Weir, Ltd., make, being fitted in the engine room. The pumping arrangement is most complete and is arranged for two separate pumps being available for every duty. To assist this idea being carried out, Messrs.

(Continued on page 294)





ENGINES AND ACCESSORY MACHINERY OF THE STEAMER *HSIN-KONG*

FAR EASTERN ENGINEERING, CONSTRUCTION, COMMERCIAL AND FINANCIAL NEWS

ELECTRIC LIGHTING, ETC

TELEPHONE SERVICE, KOREA.—A telephone service has been opened between Seoul and Chemulpo.

TOKYO CITY RAILWAY.—A new section of this line, from the Kudan to Ichigawa, has been opened to traffic.

TELEPHONE EXTENSION, JAPAN.—The telephone service between Tokyo, Yokohama, Miyanoshita, Yumoto, Odawara, Kozu and Atami is now open to public business.

KANAGAWA-SHINAGAWA ELECTRIC LINE, JAPAN.—This railway has been opened to through traffic. The cars leave each terminus every 5 mins. The through fare is 18 *sen* single journey and 34 *sen* return.

KOBE RAILWAY COMPANY, JAPAN.—At a recent extraordinary meeting of shareholders in Tokyo it was decided to issue debentures with security not to exceed -Y-2,500,000,to change the company's regulations in order to enable it to undertake the business of supplying electric light and power to the public, and to increase the number of stations in the company's electric car line.

WATERWORKS AND IRRIGATION

PENANG (S. S.) WATER SUPPLY.—The municipal commissioners of Penang have given favorable consideration to a supplemental report upon the proposal to bring in an additional supply of water from Batu Feringgi and Tanjong Bungah, compiled by Mr. L. M. Bell the municipal engineer. Mr. Bell estimates that the total cost of the improvement will be $1,095 000 Straits currency. Adding to this sum the cost of work referred to in former reports, the aggregate cost will be $1,635,000.

KOWLOON WATERWOKS GRAVITATION SCHEME.—The dam for this improvement to Hongkong's water supply, which will be about 100′ in height above ground level, has been constructed for half its height. The main from the storage reservoir to the service reservoir is nearly completed and will shortly be utilized for conveying the water from several perennial streams, thus materially increasing the present supply. The filter beds and catch water are in progress It is estimated that the whole of the works will be completed by the middle of 1907 but will be so far advanced as to afford a sufficient supply for present requirements by next dry season.

BUILDINGS

MODERN THEATER, TOKYO.—It is proposed to build a great modern theater at Tokyo, to cost -Y-2,000,000.

POSTOFFICE AND LAW COURTS, HONGKONG —It is anticipated that both of these buildings will be completed by the end of 1909.

NEW BRITISH CONSULATE, JAPAN.—The construction of a new building for the British consulate at Shimonoseki has been commenced and it is to be completed by the end of September next.

BRIDGES

YALU TO BE BRIDGED.—The Yalu River is to be spanned with an iron bridge for the purpose of carrying the railway which will join Wiju and Antung, thus bringing Fusan into direct communication with Mukden.

KOREAN BRIDGE OPENED —The Railway bridge across the Tainyong River, Korea, has recently been completed, and so the S. section of the Seoul-Wiju Railway is open to traffic as far as the S. bank of the Chhong Creek. The N. section also is open down to the N. Bank of the creek and passengers cross by an improvised foot-bridge Thus journey from Seoul to Wiju can at present be effected in 11 hrs. It used to take a week or more to make the trip.

YELLOW RIVER BRIDGE, CHINA.—The Great Yellow River Bridge in China was erected under the supervision of Messrs. Jadot and Clavier at a cost of Tls. 2,000,000. The first pile was driven December 21st, 1903, and the first train crossed the structure June 11th, 1905. The bridge, which is 9,860′ long and 25′ above the low water level, is supported on 940 steel screw piles filled with concrete, and there are 103 piers, the weight of cast-steel in the latter being 7,510 tons, and of wrought steel in the trusses 3700 tons.

PUBLIC WORKS

HIGHWAY FROM TRAM STATION TO PLANTATION-RD., HONGKONG.—By arrangement with the owners of the Peak Hotel, a portion of this road, where it affects their property, will be made immediately. When this arrangement has been fulfilled, the government will complete the road. The estimated cost of doing this is $8,300.

PUBLIC IMPROVEMENTS, PEKING.—The Chinese capital is half converted in its communications. Where one toiled laboriously through rough and muddy streets 2 yrs ago one now moves with swiftness and comfort over paved thoroughfares. The city is criss-crossed with telephones, and many other modern innovations are being introduced.

ILIGAN-MARAHUI ROAD, MINDANAO, MORO PROVINCE, P. I.—The Government of the Moro Province has formally taken possession of the Iligan-Marahui road in Mindanao, constructed by the military, and the work of repairing the highway and placing it in first-class shape is being prosecuted. It is predicted that the road will be in excellent shape its entire length within 6 mos.' time.

MINES AND MINING

ECHIGO JAPAN PETROLEUM.—The output of Echigo Petroleum in 1905 amounted to 1,293,000 *koku*, of the value of -Y-4,330,000.

FUSHUN OPENED TO JAPANESE RESIDENCE.—Fushun, Manchuria, where the coal mines are located, has been opened to the residence of Japanese.

COAL CONSUMPTION, JAPAN.—It is estimated that 600,000 tons of coal will be consumed during the current yr. at the Wakamatsu foundry, Japan.

NEW MINING UNDERTAKINGS, CHINA. — Thirty-two new mining undertakings were registered with the Chinese Government in 1904. This is an increase of 26 over registrations during 1904.

GOLD BULLION, FORMOSA.—The total amount of gold bullion produced in Formosa and bought by the Bank of Formosa, from January to November, 1905, inclusive, was 498,710 *momme*, and its value was -Y-1,978,969.

MINING IN KWANGSI PROVINCE, CHINA.—The mining bureau in Kwangsi has notified the Peking authorities that the necessary capital has been raised to work the mines in that province, and that they will be started this spring.

RICH GOLD FIND, HUEI-CHOW, ANHUI, CHINA.—A Japanese mining engineer has inspected the mines in the Jurisdiction of Huai-Chow, Anhui, owned by the San Kiang Mining Company, and reports that they are rich in gold and well worth development.

WEIHAIWEI (N. CHINA) MILLS RESUME OPERATION.—The mills of the Weihaiwei Gold Mining Company, Ltd., have resumed crushing after being idle for about a yr. Two tons of ore sent to the United States have been assayed by American experts who have reported very fully, giving satisfactory results.

ANGLO-FRENCH QUICKSILVER AND MINING CONCESSION, KWEI-CHAU PROVINCE, CHINA.—Work has lately been confined to the development of the mines at Wenshanchiang and to the production of quicksilver and cinnabar. Exploring work shows that about 1-3 of the Province of Kwei-Chau contains a great deal of mineral, which belongs to the concession. Excellent ore is being obtained from two of the company's mines.

MANGANESE ORE, BORNEO.—Of 30,000 tons of manganese ore to be delivered during the current yr. by the British Borneo Exploration Company, 18,000 tons are of the best grade and 12,000 tons of the 2d grade. The buyers have the option of buying up 12,000 tons more of the best ore and up to 28,000 tons more of the 2d grade as soon as it may be obtainable. The sales have been effected at prices assuring a very satisfactory profit.

PAHANG (F. M. S.) GOLD MINES.—The Pahang gold output in 1904 was 18,004 ozs., but in 1905 only 9,661 ozs., a reduction of almost half. This is due to Raub being now the only working gold mine in the state, and to the list of closed mines being a long one—Punjom, Selensing, Kechau, Tekkai, Tui and Sepan This is the first time during the last 11 yrs. that the gold export has failed to reach five figures, and, in this connection, it is interesting to note that the total output for the last 16 yrs., or since the commencement of British protection, had 231,269 ozs., or an average of 14,454 per yr.

COAL RESOURCES OF AUSTRALIA.—A paper recently read by Professor T. W. David before the Sydney University Engineering Society gives remarkable estimates of the coal resources of Australia. Assuming that 4,000′ would be the limit down to which coal could be profitably worked, it it calculated that there is a total of 150,000,000,00, tons of coal still available in the palaeozoic coal area of New South Wales and a like quantity in Queensland The great Morwell brown coalfields in Victoria are described as being the thickest masses in the world, consisting of two seams, one 265′ and the other 227′ in thickness; but the calorific value of this coal is greatly lessened by the high percentage of water which it contains.

GOLD MINES IN KOREA.—As efforts have recently been made by the Japanese authorities and other interested people to make it impossible for any of the gold mines belonging to the imperial household of Korea to be ceded to foreigners, the following list of mines concerned, according to *The Korea Daily News*, may be of interest:—Choong-chung Province, Chung-chu, Kong-chu and Choong-chu; Chulla Province, Kum-ku, Nam-wan, Ryeng-am and Kumsan; Kyeng-sang Province, Chung-seng, Kyeng-chu, Ulsan, Jaran, and Chang-an; Kang-won Province, Kingsung, Hong-chun, Chun-chun, and Won-chu; Hamkyeng Province, Puriong, Myeng-chun, Changhuri, Yong-am, Kilchu, Chang-chin, Chong-sung, and Samsoo; Ping-an Province. Ping-yang, Soon-an, Cha-san, Unsan, Chang-sung, Duk-chum, Tai-chun, Kang-dong, Kang-soh, and Echu; Whang-hai Province, Songwha, Cahg, chu, Suan, and Chai-riung.

GOLD MINING IN JAPAN.—Active measures are being taken by the departments of Agriculture and Commerce and of Finance, at Tokyo, to encourage the production of gold in Japan, with a view to strengthening the financial basis of the empire. The authorities mentioned have been in consultation with the Credit Mobilier, Ltd , which concern has decided to advance at least -Y-10,000,000 for the purpose of developing the gold mining industry. Moreover, gold mines will enjoy certain privileges, including exemption from mining tax. The principal gold-bearing districts in Japan are Keelung, Formosa, Kagoshima Prefecture, and the N. part of Niigata Prefecture in Fukuoka, Akita, Yamagata, Ishikawa, Fukui, Gifu, and Shizuoka prefectures, and in part of the Kokkaido, gold is also produced in good quantity. The government and the Credit Mobilier estimate that the production of gold, which at the present averages -Y-10,000,000 *per annum*, can be at least doubled by the new measures to be adopted, and this result is expected to be attained in 3 yrs.

BORNEO OIL OUTPUT.—The following statistical figures have been given from the fields in Borneo for the four 13 weeks and the whole yrs. 1905 and 1904, showing in tons the following petroleum output of the industry in the island:—

	Four 13 weeks		Years.	
Production—	1905.	1904.	1905.	1904.
Crude oil	139,120	81.600	421,695	285.720
Crude oil sold	—	8,687	33,839	19,748
Intake of refineries	113,206	76,329	347,635	255,081
Output of the refineries—				
Kerosene	49,026	26,953	145,739	79,647
Other products	52,000	40,863	166,061	143,774
Shipments—				
Kerosene	38,020	22,542	123,714	73,180
Other products	32,904	41,408	146,402	134,767
	Dec. 30, 1905.		Dec. 31, 1904.	
Crude oil in stock ground	46,649		23,377	
Stock awaiting shipment—				
Kerosene	31,237		9.225	
Other products	30,092		10,644	

INDIAN GOLD MINING RETURNS.—Following are the returns for the mo. of January, 1906.—*Balaghat.*—4,400 tons of quartz crushed yielded 3.524 oz., and 2,750 tons of tailings cyanided yielded 295 oz., making a total of 3,819 oz. of gold. *Champion Reef.* Milled 19,350 tons which produced 15,049 oz and 16,758 tons, of tailings treated by the cyanide process produced 2,173 oz., making a total production of 17,222 oz. of gold. *Mysore.*—16,150 tons of quartz crushed produced 15,252 oz. and 14,973 tons of tailings cyanided yielded 1938 oz., making a total production of 17,190 oz. of gold. *Mysore West.*—Mill ran 721 hrs., crushed 1,944 tons, which yielded 1 047 oz. bar gold, and 2,497 tons of tailings treated by the cyanide process yielded 167 oz. of standard gold. *Nundydroog.*—6,900 tons quartz crushed yielded 5,325 oz., and 6,750 tons of tailings cyanided yielded 57[illegible] oz , making a total production of 5 898 oz. of gold. *Ooregum.*—Stuff crushed 10,229 tons produced 4,52 oz. and slimes and tailings cyanided 10,886 tons produced 1,000 oz , making a total return of 5,528 oz. of gold. *Hutti.*—(Nizam's)—2,050 tons of quartz crushed yielded 859 oz and 2,000 tons of tailings cyanided yielded 280 oz , making a total production of 1,139 oz. of gold estimated value Rs. 66,000.

THE KOLAR GOLD FIELDS —For the past decade the outputs have been as follows:—

Yr.	Oz.
1896	321 023
1897	389,779
1898	416,236
1899	440,249
1900	493,342
1901	504,348
1902	514,291
1903	597,786
1904	606,233
1905	615,561

According to the monthly statements issued by the companies, showing approximately the amount of ore and tailings treated and the yields of gold, the returns for the past yrs. have been as follows:—

	1904. Quartz milled.	1904. Gold from all sources.	1905. Quartz st'mp'd.	1905. Gold from all sources.
	Tons.	Ounces.	Tons.	Ounces.
Champion Reef.	184,654	212,974	226,455	215,023
Mysore	191,000	201,968	195,650	205,389
Ooregum	127,449	73,621	121,599	66,236
Nundydroog	75,840	68,340	79,070	70,561
Balaghat	36,000	31,034	48,820	42,530
Tank Block	24,284	12,328	25,116	12,472

FEDERATED MALAY STATES TIN, 1905 —The *Perak Pioneer* says that the tin statistics for the past year are now available. The following is a brief summary:—

	1605. Output. Piculs.	1904. Output. Piculs.
Perak	446,781 52	450,670.31
Selangor	289,866.74	304,701.16
Negri Sembilan	85,132.60	85,688.41
Pahang	34,879.10	28,067.90
The above results thus:	Increase Piculs.	Decrease Piculs.
Perak	..	3,888 81
Selangor	..	14,834.42

Negri Sembilan	..	555.81
Pahang	6,811.20	..
Net decrease		12,467.94

It will be noticed the greatest falling off occurred in Selangor.

The tin revenue is as under:—

	1905. Duty.	1904. Duty.
	$	$
Perak	4,874,820 82	4,607,558.72
Selangor	3,195,317 72	3,138,649.59
Negri Sembilan	939,616 96	888,393.79
Pahang	239,872.01	178,808.87
Nett decrease		12,467.83
Totals	9,249,627.51	8,813,410.97

The above yields an increase of $436,216.54 but a the budget of the four states of the federation only anticipated a revenue of $7,907,400, the surplus is actually $1,542,217.51.

RAILWAYS, SUPPLIES, ETC

SEOUL-WIJU RAILWAY, KOREA.—The Chuwa tunnel on this line has been completed and is now serving the purpose for which it was constructed.

NATIONALIZATION OF RAILWAYS, JAPAN.—The Japanese Government is introducing a bill to the diet to nationalize the railways within the empire.

MANCHURIAN RAILWAYS.—The question is now being discussed in Japan whether to retain or alter the extremely narrow (Japanese) railway gauge, temporarily adopted during the war, on that portion of the East China Railway which fell into Japanese hands. Popular sentiment in railway circles is for the broad gauge.

TIENTSIN-CHINKING RAILWAY.—The metropolitan officials who are natives of Chihli, Shantung and Kiangsu decided recently to cancel the agreement about the railway between Tientsin and Chinking, and the viceroy is asked to negotiate with the German authorities to cancel the German portion of the concession.

RAILWAYS IN FUKIEN, CHINA.—Plans have about been consumated to commence work on the construction of these lines immediately It is understood that the line from Amoy to Chan-Chou, 90 *li* long, will be first constructed and put in operation, as a specimen of the whole line to be constructed for the benefit of capitalists.

HSIN-MIN-TUN-TO-MUKDEN RAILWAY.—The Russian authorities object to China constructing a railway from the former to the latter point on the ground that such a line would be in violation of the principle of the Manchurian Agreement which debars any railway coming within 40 *li* on either side of the Chinese Eastern Railway.

ANHUI RAILWAYS, CHINA.—The director-general of Anhui Railways calculates that Tls. 4,000,000 now being subscribed will not be sufficient for all the requirements of the Wuhuh-Kuangtechou Railway, which is about 280 *li* in length, and has decided to raise an additional Tls. 1,000,000. It is expected that actual work will commence in June of the current yr.

HANKOW-CANTON RAILWAY.—A meeting was recently held in Canton to consider the Hankow-Canton Railway scheme and was attended by 10,000 merchants and others. It was agreed that those present should themselves subscribe £2,000,000 in 4,000,000 shares of $5 (Mex.) each A bank to carry out the necessary financial arrangements is already being established. It will be managed by merchants, not by officials.

YUNNAN RAILWAYS.—The Yunnan students who are at present studying in Japan have protested against a British proposal to construct a railway from the frontier of Burma to Teng-yueh, by a British-Chinese company. The students declare that such a step would be tantamount to giving up Yunnan to foreigners, an example of which being furnished by the Chinese Eastern or Manchurian Railway, which was the means of China nearly losing Manchuria to Russia.

RAILWAY IN KANSU, CHINA.—The viceroy of Shen-Kan (Shensi-Kansu) has, in concert with the gentry and representative merchants of Kansu, drawn up a scheme for raising a sum of $1,300,000 for the construction of a railway system in their province. The viceroy has telegraphed the scheme to the Waiwupu and Shangpu, besides telegraphing to the Kansu officials at the metropolis, who are requested to bear a share of the burden in raising the required amount.

RAILWAY INFORMATION WANTED AT PEKING.—The Board of Commerce of the Chinese Government being short of information regarding the railways of the empire, the minister of the board has directed the various viceroys and governors to furnish full particulars of all railway works, together with copies of all official documents and plans, etc, connected therewith. The viceroys and governors are also ordered to do their utmost to raise the necessary funds for pushing on the work of building all urgent railways.

FENGTAI-SHAHO SECTION, PEKING-KALGAN RAILWAY.—The director of the Peking-Kalgan Railway reports the completion of the Fengtai-shaho section which has been opened to traffic. The engineer in-chief, Taotai Chan Tien-yu, will soon receive bids ior the construction of the tunnel through Pataling Mountain, which is about 2,000′ in height. The cost of the tunnel is estimated at Tls. 2,000,000. Some reports have it that the contract has already been secured by a foreign firm at Tientsin, but they are not believed to be well grounded.

MEKLONG RAILWAY COMPANY, LTD., BANGKOK.—At the first general meeting of the shareholders of this company the directors presented a statement of accounts for the construction of this line. The work on the whole line has proceeded most satisfactorily. Piles for six bridges have been completed and 20 kms. of rails have been laid. The concession cost Tcs. 180,000 and during 1905 advance payments on rolling stock were made to the amount of Tcs. 70,000, and the construction executed represents an outlay of Tcs. 101,200.

RAILWAY LINES, JAPAN.—In the work of laying double lines in the government railways 292 ms. have thus far been completed, while 19 ms. are in course of construction, and 71 ms. are not yet commenced. Of the total of -Y-300,000 set down for repairs of government railways in the budget for the current fiscal yr., -Y-67,000 are meant to be partly for lines under construction and partly for lines not yet started, *viz.*, 16 ms. between Ishibe and Kanaya; 15 ms. S. along the Kakegawa and Tenryugawa; 24 ms. between Okazaki and Atsuta, and 19 ms. between Nagoya and Gifu.

PORT WORKS, DOCKS, ETC.

KAWASAKI DOCKYARD COMPANY, LTD., KOBE.—This company has orders for 31 various vessels. It will extend its works, raising its capital from -Y-4,000,000 to -Y-10,000,000, and borrow -Y-10,000,000 abroad by debentures.

WHANGPU CONSERVANCY, SHANGHAI.—Mr. J. de Rijke, the new engineer for the Whangpu Conservance Board, Shanghai, has arrived in the settlement and indications now point to great activity towards beginning this important work.

NEW WHARVES, ZAMBOANGA, MORO PROVINCE, P. I.—Plans are being prepared for new docks at Zamboanga, the capital city of the Moro Province, which will cost in the neighborhood of ₱90,000. These docks will be constructed so as to admit vessels drawing 30′ of water.

ANOTHER DREDGE OF CALCUTTA.—The Calcutta port commissioners have ordered of Messrs. Wm. Simons & Co., Ltd, Renfrew, a very large sand suction pump dredge, fitted with four sets of independent triple-expansion engines and four large cylindrical boilers, to dredge sand at the rate of 5 000 tons per hr. The new craft will be utilized for the improvement of the River Hooghly.

YOKOHAMA DOCK COMPANY.—This company contemplates an enlargement of its largest dock to the extent of 100′ so that any vessel of 12,000 or 13,000 tons may be docked It also intends to adopt electricity as the motive power in all workshops. The company has first decided to construct a wet dock, on the E. and W. sides of which two vessels of over 5,000 tons may be repaired simultaneously. Work on the wet dock has been commenced.

YOKOHAMA HARBOR IMPROVEMENTS.—According to the present plan the proposed Yokohama harbor improvement scheme will be extended over a period of 6 yrs., and will require an outlay of about -Y-8,500,000 The City of Yokohama will provide ⅓ of the sum. It is believed that the municipality will raise the money by a loan, and one of the foreign firms of the city is reported to have applied already to the mayor for permission to take up the whole of the proposed loan.

NEW DOCK, JOLO, MORO PROVINCE, P. I.—The new dock at Jolo has been finished by the Atlantic, Gulf and Pacific Company, and cost the Moro Province which is meeting all expenses of public improvements in that section, about ₱26,000. Steamers drawing 26′ of water can tie up alongside the new dock for discharge, which advantage not ouly results in prompt discharge of cargoes and naturally a liberal reduction in freight rates, but proves of great convenience to Jolo merchants.

PORT IMPROVEMENTS, PHILIPPINE ISLANDS.—The following sums, or so much thereof as may be necessary, have been appropriated by the Government of the Philippine Islands for public works and improvements by the Bureau of Port Works:—For completion of existing contracts for the new harbor of Manila, and for the continuance of the improvements of the Pasig River, and incidental expenses, -P-500,000; for additional expenses incident to modification of plans for the improvement of the port of Cebu, -P-241,520; for the maintenance of two survey parties to investigate the ports of the Philippine Archipelago which are destined to be railway termini, and other ports, -P-36,000. In all, -P-677,520.

SINGAPORE HARBOR IMPROVEMENTS.—The crown agents for the colonies have announced to the Government of the Straits Settlements that the most favorable tender for the Singapore harbor improvements is that of Sir John Jachson, Ltd., London, at £991,000 with £39,293 added for making the depth of water alongside quaysage 18′. This makes a total estimate of £1,030,693, say, allowing for contingencies and exchange, etc., $10,000,000. For this sum the contractors will undertake all the work mentioned in the report of Messrs. Coode Son & Matthews, which has appeared in THE REVIEW, excluding the S. and E. moles. Thus what Singapore is to get is the W. mole, lying off Malay Point, and the inner S. mole sheltering this and the Telok Ayer reclamation generally, and also the latter reclamation. In short, the proposed reclamation at Telok Ayer with 18′ depth of water at the quayside and the inner basin, such being the area of water protected by the W. mole and the inner S. mole, the general scheme of a large and extensive harbor as formed by the S. and E. moles being left untouched for the present with the proviso that the contractors may be required if necessary to carry out this work also within 2 yrs. from the acceptance of the present tender. Under the tender the contractors assume all risk with the exception of the possible settlement of rubble in the moles in excess of quantities shown by the contract drawings. The consulting engineers consider this proviso practically negligible as affecting the cost of the improvement. The time required to complete the entire work is 13½ yrs.

SHIPBUILDING, MARINE, ETC.

MITSU BISHI'S FIRST WARSHIP.—The first warship built at the Mitsu Bishi yard at Nagasaki, the destroyer *Shiratsuyu*, 381 tons and 29-knot speed, has been launched.

NIPPON YUSEN KAISHA.—This Japanese steamship company has re-opened its 4-weekly service between Hongkong and Seattle. The monthly service to Australia has also been resumed, the first steamer being *Yawata-maru*, sailing from Yokohama and Nagasaki.

TRIAL RUN OF JAPANESE DESTROYER *Asakaze*.—A trial run of the destroyer *Asakaze*, constructed by the Kawasaki Dockyard Company, Ltd., at Kobé, took place recently, and the result was highly satisfactory to commissioners of the Imperial Navy Department who were on board.

MESSRS. BAILEY & CO., HONGKONG.—A new steam launch built to the order of the China Merchants Steam Navigation Company by Messrs. Bailey & Co., by which firm it was also engined, has been delivered at Foochow. Her name is *Shun Lee*, and she is intended to be used in the private business of the China Mutual at Foochow. She is 55′ long and has a speed of 9½ knots.

ROYAL MAIL STEAM PACKET COMPANY.—This company, the oldest established steamship line in the world, has purchased the goodwill and interest in the Orient Line of the four vessels belonging to the Pacific Steam Navigation Company. The purchase thus consists at the present of *Ortona*, *Ortova*, *Oruba*, and *Oroya*. These vessels, in conjunction with the Orient Line, now carry the Australian mails to England, and the working of the joint line will be continued as hitherto.

NEW CHINA MUTUAL CARGO STEAMER.—Messrs. Armstrong, Whitworth & Co. recently launched at their shipbuilding-yards in England a large cargo steamer for the China Mutual Steam Navigation Company, of Liverpool *Myrmidon*, as she is named, is of the following dimensions:—Length over all 409′, breadth 49′3″, depth 31′6″. She carries a total dead weight

STEEL SCREW STEAMER "HSIN-KONG"

(Concluded from page 292.)

G. & J. Weir, Ltd., supplied a separate "stand-by" independent dry air pump driven direct by vertical steam engine.

The main bilge pumps, two in number, are placed horizontal on an engine seat and are driven direct by a main crank shaft, with arrangement for overhauling one while the other is working.

A "Hocking" patent distiller of 1,000 galls. capacity per 24 hrs. is fitted on the upper platform of the engine room, steam being supplied by a donkey boiler with a filter and distilled-water connection to the storage tank.

BOILER INSTALLATION.—The main boilers, built by Messrs. S. C. Farnham, Boyd & Co., Ltd., are of large power for the speed of the vessel and are designed to British Board of Trade requirements for a working pressure of 160 lbs. per sq. in. They possess all the latest improvements in boilermaking, the shell plates being in one continuous length and the end plates flanged by special machinery. They are fitted with the usual mountings and are placed thwartship with a large roomy stokehole at the after end.

The donkey boiler, also built by Messrs. S. C. Farnham, Boyd & Co., Ltd., is of the "Cochrane" type, 13′ high by 6′ diameter, designed for a working pressure of 100 lbs. per sq. in., and placed in a recess between the engineroom and the stokehole. It is fitted with a separate feed donkey, and the usual mountings, to allow of steam being supplied to dynamo, winches, steering engine, windlass, heaters, and all auxilliary pumps, etc.

All other engineroom fittings are most complete and include a large stock of spare gear, outfit, Chadburn's telegraph to the bridge, oil tanks, etc.

of 7,000 tons on a moderate draught of water. She will be fitted with triple-expension engines, and the speed designed is about 12 knots.

NEW CHINA COAST STEAMER.—The new steel steamer *Cheong Shing* (Prosperous Promotion), built by Messrs. W Dodson & Co., Low Walker-on-Tyne, to the order of the Indo-China Steam Navigation Company, Ltd., of London, for its service on the China Coast, was given a successful trial trip recently. This vessel, which is of the spar-deck type, with bridge and forecastle, is of the following dimensions:—Length between perpendiculars, 265′; breadth, 47′; depth moulded, 25′; and she is designed to carry a dead-weight of about 2,600 tons.

CANADIAN PACIFIC'S PACIFIC SERVICE.—The Canadian Pacific Railway Company's SS. *Monteagle*, which has been detached from the company's Atlantic fleet to supplement its intermediate service on the Pacific, sailed recently from England for Hongkong *via* the Cape of Good Hope. The finishing touches to her excellent new passenger accommodations will be given to her at Hongkong, and she will be ready to sail hence for Vancouver, *via* Shanghai, Nagasaki, Kobé and Yokohama, May 2d, making her due at destination May 26th, as per schedule. *Monteagle* is a twin-screw steamship of 5,500 tons.

JAPANESE SHIPOWNERS' UNION.—The Japanese Shipowners' Union is an amalgamation of small shipowners possessing altogether about 180 steamers with an aggregate tonnage of 350,000. A few vessels are large, but most are coasters of moderate tonnage. This union has long cherished a desire to establish a great ocean line, and rumor says that the idea will soon be carried out. There are to be regular lines to Korea, China, Europe, and America, both North and South. It is reported that the company has received offers from South America, Oceania, and China, from people wishing to join. There is talk of raising -Y-20,000,000 capital.

NIPPON YUSEN KAISHA'S EXTENDED SERVICE.—This company's regular European line, taking freight and passengers between Japanese ports, Shanghai, Singapore, Penang, Colombo, Suez, Port Said, Marseilles, London and Antwerp, will be resumed in April, opening with the SS *Bingo-maru*, leaving Yokohama about April 4th, to be followed by the SS. *Sado-maru* or *Kawachi-maru* on or about April 18th; thereafter one steamer every fortnight. The American line, between Hongkong, Shanghai, Japan ports and Seattle (connecting there with the Great Northern Railway), will also be resumed, beginning with *Shinano-maru*, to leave Hongkong April 3d. There will be provisionally a monthly service, after which a regularly fortnightly service will be maintained.

MESSRS. HOWARTH ERSKINE, LTD, SINGAPORE.—The railway department of the Federated Malay States recently placed a contract with this firm for a new tug for use at Port Swettenham. This boat has just been completed under survey of the government marine surveyor with most satisfactory results. At the official trial both speed and towing were in excess of the contract to the extent of ¾ of a knot and 1¾ ms. respectively In the first case 10 knots per hr was attained, and in the second 6¾ ms In the experiments two 75-ton tongkongs with 60 tons of cargo in each were towed The scantlings, boiler and engines are in excess of Board of Trade requirements, and the built and finish of the boat have evoked unqualified approbation from those competent to judge, and the work reflects great credit on the firm—Singapore *Free Press*.

FINANCIAL

FUJI PAPER MILL, JAPAN.—This company paid a dividend at the rate of 10 per cent *per annum* on its 1905 business.

FIRE INSURANCE COMPANIES, JAPAN.—In view of the present cut-throat competition, it is proposed to amalgamate the Japanese fire insurance companies.

SHANGHAI-SUMATRA TOBACCO COMPANY, LTD.—This company has declared a final dividend of Tls. 3 for 1905, making in all Tls. 5 per share for the year.

TOKYO STREET RAILWAY.—The net profits of the Tokyo (Japan) Street Railway during the half-yr. ended December 31st, 1905, were -Y-353,322. Two dividends were paid.

TOKYO GAS COMPANY.—At a general meeting of the Tokyo Gas Company held at the Tokyo Chamber of Commerce recently, a dividend at the rate of 15 per cent *per annum* was declared for the latter part of 1905.

POSTAL SAVINGS BANKS, JAPAN.—The deposits in Japanese postal savings banks were -Y-33,300,000 at the end of 1904 and -Y-52,000,000 at the end of 1905, showing the remarkable increase in 1 yr. of nearly -Y-19,000,000.

SHANGHAI TUG AND LIGHTER COMPANY, LTD.—This company has declared a final dividend of Tls 3 for the ordinary and Tls. 1 75 for the preference shares, making in all Tls 5 and Tls. 3 50 respectively, for the year ended December 31st, 1905.

W. F STEVENSON & CO., LTD—W. F. Stevenson & Co., Ltd., have been registered in London with a capital of £50,000. and have acquired the business of the same name—merchants, commission agents, etc.—in Manila and elsewhere in the Philippine Islands.

LAOU KUNG MOW COTTON SPINNING AND WEAVING COMPANY, LTD.—This company has written off Tls. 34,039.86 to depreciation account. The working of 1905 shows a credit at profit and loss account of Tls. 173,685.28 including Tls. 10,000 brought forward from 1904.

JAPAN (KIRIN) BEER BREWING COMPANY, LTD.—The report of this company for 1905 shows a divisible balance of -Y-128,702 the paid-up capital of the company being -Y-450 000. The beer tax paid for the year amounted to -Y-183 228, and a dividend of 20 per cent will be paid.

FISHERY BANK, JAPAN.—It is stated that a bill for the establishment of a fishery bank will be introduced into the Japanese Diet shortly. The capital of the proposed bank will be -Y-10,000 (00, and the institution will be authorized to issue debentures to the limit of five times its capital.

WEST POINT BUILDING COMPANY, LTD, HONGKONG.—The report of this company for 1905 shows a divisible balance, less the interim dividend of $1 75 per share already paid, of $74.523. It is proposed to pay a final dividend of $1 90 per share, making $3.65 for the yr., and carry forward the balance, $773.

NIPPON RAILWAY COMPANY.—The report of this company for the half-year ended December 31st, 1905, shows a divisible balance of -Y-4 814,191. It is proposed to pay a dividend at the rate of 13 per cent *per annum*, making appropriations to reserve, depreciation, etc., and carry forward -Y-676,072.

TOKYO ROPE FACTORY.—It is announced that the Tokyo Rope Factory in Azabu, which is under the presidency of Baron Shibusawa, is now going to extend its business, and to raise fresh capital to the extent of about -Y-300,000. A branch factory will be established in Kokura, Buzen Province, shortly.

KEIHIN ELECTRIC COMPANY, JAPAN.—At the recent general meeting of this company the balance-sheet for the half-yr ended December 31st, 1905 showed net profits totalling -Y 56,786 15 which includes -Y-309.-36 brought forward from previous account A dividend of 8 per cent *per annum*, amounting to -Y-51,000, was declared

HONGKONG LAND INVESTMENT AND AGENCY COMPANY, LTD—The report of this company for 1905 shows a divisible balance, less the interim dividend of $3.50 per share already paid, of $242,839. A final dividend of 3 1-3 per cent has been declared, making 7 per cent for the yr., and the balance, $67,839, has been carried forward to current account.

KIANGSI RAILWAY BANK, CHINA.—It has been decided to locate the railway bank at Kiukiang, while branch banks will be established at Shanghai, Hankow and Nanchang. Funds have already been remitted from the head office of the railway at Nanchang to Kiukiang, for the preliminary expenses of establishing the aforementioned bank.

CANTON-HANKOW RAILWAY.—It was recently ordered that the intending shareholders in the Chinese company formed to undertake the construction of the Canton-Hankow Railway shall pay their subscriptions in 20c pieces. As the capital subscribed at that time was about $4,000,000 and growing rapidly the next thing to look for is a "corner" in 20c pieces very soon.

OSAKA SHOSEN KAISHA, JAPAN.—This steamship company has formally determined to increase its capital stock from -Y-11.000.000 to -Y 16,500.000. The new shares will be offered to the present shareholders at the rate of one new share to every two old ones, and those who intend to take up the new shares must deposit -Y-1 for each new share, by April 15th. On May 1st there will be the first call of -Y-7 per share.

HOKKAIDO COLLIERY AND RAILWAY COMPANY, LTD.—The issue has been made of bonds for £1.000,000 of this company, on the London market. The issue is in 1st-mortgage 5 per cent sterling bonds at 98 ½ repayable in 1921. The subscription list was to have been kept open three days, but the issue was so well received that it was closed in less than 36 hrs. It is believed that the issue has been taken mainly by investors.

SHANGHAI'S BUDGET, 1906.—It is unofficially announced that the Municipal Council of the settlement estimates the ordinary public expenses for the yr. at Tls. 1.774,000 and that at the end of the period there will be a surplus of Tls. 260,000. This surplus, with that from 1905—about Tls. 220,000—is carried to extraordinary income; but as the extraordinary expenditure is estimated at Tls 529.500,000 there will be a deficit at the end of 1906 of Tls. 47,500.

KOWLOON LAND AND BUILDING COMPANY, HONGKONG.—The net profits of the 1905 working amounted to $15,746 50 as against $18 291 24 for 1'04. This is accounted for by the gross rents being about $800 less, the absence of the item of unclaimed dividends which appeared the previous yr., and by the large sum expended on the drainage and other repairs required by the sanitary regulations. Messrs. T. F. Hough and A. Rodger have been re-elected directors.

SOY CHEE COTTON SPINNING CO., LTD., SHANGHAI.—March 6th the eleventh ordinary meeting of the shareholders in this company was held in the office of Messrs Arnhold. Karberg & Co. The general manager reported that the native cotton crop of 1905 has been a very satisfactory one and the whole of the production sold at very remunerative prices. The working of the yr. shows a balance at credit of profit and loss account of Tls. 206.824 19, including an amount of Tls 22,050.78 carried forward from 1904.

HOKKAIDO COLLIERY AND RAILWAY COMPANY, JAPAN.—This company has declared a dividend of 15 per cent on the working of 1905 and carried forward to current account -Y-500,000 A scheme is on the tapis to organize another colliery company in Hokkaido, to be called Ishikari Tanko Kabushiki Kaisha, With a capital of -Y-15,000,000. The promoters are Baron Shibusawa, Mr. S. Asano, Mr. K. Okura, Mr. S. Nakamura, and others. Half the shares will be offered, in all probability, for foreign subscription.

HONGKONG, CANTON AND MACAO STEAMBOAT COMPANY, LTD., HONGKONG.—The report of this company for the half-yr. ended December 31, 1905, shows that after paying running expenses, etc., there remains, including the sum brought forward from previous account, $104,080.93 at credit of profit and loss account. From this amount a dividend of $1 per share amounting to $80 000 will be paid to shareholders and the balance, $24,080.93 carried forward. The Hon. Mr. C. W. Dickson and Mr. H. Schubart resign their seats at the board and are succeeded by Messrs. W. A. C. Cruickshank and C. R. Lenzmann.

OJO COLLIERY COMPANY, JAPAN—This company is a joint stock concern which was established some 12 yrs ago, with a capital of -Y-100,000 for the purpose of working one of the Ikawi coal mines It was not a success at the first, and a series of misfortunes brought the company into such a distressful condition that it was on the verge of dissolution, when the management came into the hands of Messrs. Y. Kawai and Y Hamamoto, as directors. Since then the business of the colliery has assumed a different aspect and at the recent half-yearly meeting of the company a most gratifying condition was reportedf

SHANGHAI PULP AND PAPER COMPANY.—The report of this company (1905), the paid-up capital of which is Tls. 450,000, is a remarkable good one. The net profit for the year was over Tls 100,000, and after paying an interim dividend of 6 per cent, writing off Tls 9,362 for additions and repairs, and Tls. 11,090 for depreciation, placing Tls. 12.000 to reserve and Tls. 8.000 to equalization of dividend funds, there remains a divisible balance of Tls 38,783 (including Tls. 5,968 brought forward from 1904). The directors propose to pay a final dividend of 8 per cent, making 14 per cent for the year, and carry forward the balance, Tls. 2,753 to current account.

BANGKOK MANUFACTURING COMPANY, LTD.—In their report for the half-yr ended December 31, 1905, the directors of this company show net profits on the sale of ice and aerated waters for the 6 mos. amounting to Tcs. 26 222 From this the usual 6 per cent dividend has been declared. This absorbs Tcs. 16,800. The balance of Tcs 20 000 due for the premises recently acquired from the Siam Electricity Company, Ltd., is now paid for in full and the debentures amounting to Tcs. 16,500 have all been redeemed. The new ice plant is now under erection When this is completed the company's plant will be capable of producing 32 tons per day, a quantity that should be sufficient to meet the demands of consumers during the next 10 yrs.

MISCELLANEOUS

AMALGAMATION OF SUGAR INTEREST, JAPAN.—It is reported that there is a plan on foot in Osaka to amalgamate all the sugar refineries of Japan, but the negotiations are making slow progress.

MATCH FACTORY AMALGAMATION, JAPAN.—The scheme of the amalgamation of all the match factories of Japan has been completed, and the union is now only waiting for the diet to pass a bill concerning business monopolies, and then the realization of the scheme is expected to be complete.

DEVELOPING CHINESE MANUFACTURES—A supervising censor of the Chinese Government recently presented a memorial to the officials at Peking, calling attention to the fact that the import of foreign manufacturers is daily increasing and that it is imperative for China to establish manufactures of her own, purchasing the necessary machinery from foreign countries. The memorial has been approved

ENGINEERS' ASSOCIATION OF SINGAPORE.—At the annual general meeting of the Engineers' Association of Singapore, recently held, the following officers were elected:—President, James Le Mesurier; vice-president, A. Cook; honorary secretary, Alex McLellan; honorary treasurer, James Graham; honorary assistant secretary, William Frew; house committee, W Hepburn, A. Lyon, A. Birnson and W. Houston. The association is in a prosperous condition.

INSTITUTION OF ENGINEERS AND SHIPBUILDERS, HONGKONG.—This association has elected the following officers for the current yr :—President, H T. Richardson; vice-president, J Lambert, R N. R., and E. O. Murphy; committee of management, W A. Crake, W. Ramsay, J. F, Miller, E. C Wilks, W. C Jack, T W. Robertson, A. Ritchie, J. D. Morrison, T Skinner, J. D. Logan, C. F. Focken and J. McCubbin. This association has 291 members at the present time.

COTTON MILL INDUSTRY, CHINA.—The report issued by the general managers of the Laoukungmow Cotton Mill, Messrs. Ilbert and Co , of Shanghai, of the working of that industry during 1905, is encouraging On a paid-up capital of Tls. 715,800 the actual profit is Tls. 173.685, and the directors pay a dividend of 8 per cent, put over Tls 75.000 to depreciation, or more than double what was set aside the previous year, and are able to carry forward nearly Tls. 31,000.

SUCCESSFUL SUGAR SEASON, QUEENSLAND.—The past sugar season in the State of Queensland, Australia, the only state in Australasia in which sugar is grown, has been a very successful one. The crop for 1904 was the largest since 1898 and the second largest on record. There were 120,317 acres under cane, 82,741 acres of cane crushed and 147.688 tons of sugar manufactured. The by-products consisted of 4,491,407 galls of molasses and 260.289 galls. of spirits. Increased prices were obtained, being $61.04 per ton against $54 32 in 1903 on the basis of 94 per cent sugar.

FAR EASTERN SHARE QUOTATIONS

COURTESY OF BENJAMIN, KELLY & POTTS, SHAREBROKERS, HONGKONG, March, 1906.

STOCK	WHEN ESTABLISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation*	CLOSING QUOTATIONS
											PER CENT	
Banks.												
Hongkong and Shanghai Banking Corporation	1865	$10,000,000	80,000	$125	$125	*g* £1,000,000 *s* $8,500,000 *i* $250,000	... $1,699,777	31-12-05	£1 15/- div & £1 bonus @ ex. 2/0-9/16 $26.87 for second half-year 1905	26-2-06	5	860 London £91¼ ex. div. and bonus
National Bank of China, Limited	1891	£699,475	99,925	£7	£5	$200,000	.....$41,768	31-12-04	$2 (London 3/6) for 1903	1-2-04	—	$38 buyers
Marine Insurances.												
Canton Insurance Office, Limited	1881	$2,500,000	10,000	$250	$50	$1,600,000 *j* $147,895	..... $211,540	31-12-04	$20 for 1904	21-10-05	6	$340 buyers
China Trader's Insurance Co., Ld.	1865	$2,000,000	24,000	$83.33	$25	$950,000 *f* $169,215 *j* $202,455 *u* $296,955	..... Nil.	30-4-05	$4½ for year ended 30-4-1905	18-12-05	5	$94
North China Insurance Co., Ld.	1863	£150,000	10,000	£15	£5	*g* £100,000 *s* Tls. 100,000 *f* Tls. 50,000	...Tls. 302,053	30-6-05	Final of 7/6 making 15/- for 1904	25-10-05	5½	Tls. 95
Union Insurance Society of Canton, Limited	1867	$2,500,000	10,00 0	$250	$100	*s* $2,000,000 *g* £40,000 *f* $331,453 *j* $1,043,930 *u* $1,152,346	.....$2,339,112	30-6-05	$40 for 1904	20-10-05	5¼	$750 buyers
Yangtsze Insurance Association, Ld.	1862	$800,000	8,000	$100	$60	$750,000 *i* $50,000 *j* $5,890	..... $599,364	31-12-04	$12 and $3 special dividend for 1903	12-4-05	7¼	$180
Fire Insurances.												
China Fire Insurance Co., Ld.	1870	$2,000,000	20,000	$100	$20	$1,000,000 *x* $218,039 *f* $2,241	..... $260,374	31-12-04	$6 dividend and $1 bonus for 1903	10-3-05	8	$89 buyers
Hongkong Fire Insurance Co., Ld.	1868	$2,000,000	8,000	$250	$50	$1,200,505	..... $360,372	31-12-04	$34 for 1903	7-3-05	10¾	$325 sellers
Shipping.												
China and Manila Steamship Co., Ld.	1882	$750,000	(*1*) 30,000	$25	$25	$5,000	$8,832	31-12-04	$1 for 1904	27-3-05	5	$21 sellers
Douglas Steamship Co., Ld.	1883	$1,000,000	20,000	$50	$50	$261,638 *i* $88,941	..... Nil.	30-6-05	$3½ for year ended 30-6-1905	25-9-05	8¾	$40 buyers
Hongkong, Canton and Macao Steamboat Company, Ld.	1865	$1,200,000	80,000	$15	$15	*e* $250,000 *d i* $600,000 *f* $145,331	.....$24,080	31-12-05	$1 for second half-year 1905	16-2-06	8¼	$24½ sellers
Indo-China Steam Navigation Company, Ld.	1882	£1,200,000	(*2*) 60,000	£10	£10	£120,000 *i* £241,150 *h* £3,999	..... £4,435	31-12-04	12/- @ 1/10 7/8=$6.29.51 for 1904	13-7-05	6½	$96
Shanghai Tug and Lighter Co., Ld.	1903	Tls.1,500,000	200,000	Tls. 50	Tls. 50	*i* Tls. 25,000	... Tls. 43,762	31-12-04	Interim of Tls. 2. for 1905 Interim of Tls. 1¾ for 1905	28-8-05	7½ 7½	Tls. 60 buyers Tls. 50 buyers
Do. Preference			100,000									
"Shell" Transport & Trading Co., Ld.	1898	£2,000,000	2,000,000	£1	£1	£400,000 *i* £4,144	.....£7,815	31-12-04	1/- (Coupon No. 6) for 1905	1-1-06	4¼	24/6
"Star" Ferry Co., Ld	1898	$200,000	10,000	$10	$10	$65,000 *t* $24,257	..... $929	30-4-05	$1.80 90 cents for year ended 30-4-1905	29-5-05	5¾ 4	$32 buyers $23 buyers
	1900		10,000	$10	$5							
Straits Steamship Co., Ld.	1890	$500,000	(*3*) 5,000	$100	$100	$400,000 *e* $21,075 *i* $130,153	.... $21,231	31-12-04	$10 for 1904	21-3-05	7	$147½ buyers
Taku Tug & Lighter Co., Ld.	—	T.T 1,500,000	30,000	T.Tls.50	T. Tls.50	Tls. 98,000 *d* Tls.195,479 *e* Tls. 28,000 *i* Tls. 81,200	... Tls. 4,333	31-12-04	Final of Tls. 2 making Tls. 4 for 1905	1-3-05	11	Tls. 36 ex. div.
Refineries.												
China Sugar Refining Company, Ld.	1878	$2,000,000	20,000	$100	$100	*e* $450,000 *r* $150,000	..... $42,812	31-12-04	Interim of $10 for 1905	18-8-05	10	$214
Luzon Sugar Refining Company, Ld.	1882	$700,000	7,000	$100	$100	none	..... $85,987	31-12-04	$3 for 1897	24-3-98	—	$37
Perak Sugar Cultivation Co., Ld.	—	Tls. 350,000	7,000	Tls. 50	Tls. 50	Tls. 100,000	... Tls. 3,723	31-7-05	Tls. 2½ for year ending 30-9-1904	17-12-04	—	Tls. 72½ sales
Mining.												
Chinese Engineering & Mining Co., Ld.	1901	£1,000,000	1,000,000	£1	£1	*d* £80,000 *h* £12,289	..... £13,355	28-2-05	Final of 1/- (No. 5)	2-11-05	—	Tls. 10 buyers
Oriental Consolidated Mining Co., Ld.	1901	G.$5,000,000	*y* 500,000	G. $10	G. $10	none	G. $909,050	30-6-05	Final 50 cts. mak. G. $1 for 1005	21-12-05	—	G. $16
Raub Australian Gold Mining Co., Ld.	1892	£200,000	150,000	£1	18/10	£4,873	..... £8,745	31-3-05	No. 12 of 1/-=48 cents	28-1-01	—	$3½
			50,000	£1	£1							

STOCK	WHEN ESTAB-LISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation	CLOSING QUOTATIONS
											PER CENT	
Docks, Wharves and Godowns.												
Farnham (S. C.), Boyd & Co., Ld	1901	T5,520,000	55,200	T100	T100	T1,000,000	.....T34,924	30-4-05	Interim of Tls. 4 for year 1905-6.	6-1-06	9¾	T122½ sales
Fenwick (Geo.), & Company, Ld.....	1889	$450,000	*z* 18,000	$25	$25	$70,000	..... $8,577	31-12-04	$3¾ on old capital for 1904.....	13 3-05	—	$23 sellers
Hongkong and Kowloon Wharf and Godown Co., Ld.....	1886	$2,000,000	40,000	$50	$50	$250 000 *d.r.* $58,423 *i* $10,000 *p* $300,000	.....$29,422	31-12-04	Interim of $2½ for 1905.....	26-7-05	4¾	$107 sellers
Hongkong & Whampoa Dock Co., Ld.	1866	$2,500,000	50,000	$50	$50	*i* $49,500	.....$362,323	31-12-05	$6 for second half year '05	27-2-06	8	$156 ex div.
New Amoy Dock Co., Ld.....	1892	$67,500	10,000	$6¾	$6¾	$55,500	—	31-12-05	$1 for 1905.....	1-3-06	7	$16 ex div.
Shanghai and Hongkew Wharf Co. Lt.	1902	T3,200,000	32,000	T100	T100	*b* T487,210 *r* T59,880	.....T10,711	31-12-04	Interim of T6 for 1905.....	23-8-05	5¼	T225 sellers
Vulcan Ironworks, Ltd.	1905	T500,000	1,000	T500	T375	—	—	—	First year.....	—	—	T375 buyers
Yangtsze Wharf and Godown Co., Ld..	1902	T250,000	2,500	T100	T100	T17,500	.....T2,762	31-12-04	T18 for 1904.....	29-3-05	8¼	T215 buyers
Lands, Hotels and Buildings.												
Anglo-French Land Investment Company, Ltd.....	1906	T2,500,000	*(3)* 25,000	T100	T100	—	—	—	First year	—	—	T100
Astor House Hotel Co., Ltd.	1901	$750,000	*(4)* 30,000	$25	$25	$14,156 T34,000	.....$9,028	30-6-05	$2½ for year ending 30-6-1905	19-8-05	9	$27 buyers
Astor House Hotel, Ld. (Tientsin)	—	TT100,000	2,000	T. T50	T. T50	*e* T8,000	..... T806	29-2-05	Interim of T5.....	21-10-05	8	T130 buyers
Central Stores, Ld.....	—	$91,845	6,000	$15	$12	$20,000	.....$1,502	31-12-04	Final of 60 cents making $1.80 for '04..	30-3-05	12	$15
									None.....	—	—	$100
Do. (Founders').....			123	$15	$12				Preferential of 7% for '04.....	30-3-05	7	$7½
Do. (New Issue).....	1904	$360,000	24,000	$15	$7½	$648,975 *r* $31.087	.....$10,126	30-6-05	$5 for first half-year 1905.....	4-9-05	6¾	$140
Hongkong Hotel Co., Ld.	1866	$600,000	12,000	$50	$50	*e* $250,000	.....$67,839	31-12-05	Final of $3½ making $7 for 1905....	2-2-06	6	$115
Hongkong Land Investment and Agency Co., Ld.	1889	$5,000,000	50,000	$100	$100	*n* T20,986	.....T7,202	31-3-05	Interim of T1.....	1-11-05	14	T17 buyers
Hotel des Colonies Co., Ld. (Shanghai)	1902	T225,000	9,000	T25	T25	none	..... $4,699	30-6-05	Final of $6 making $10 for the year.	26-7-05	10	$100
Hotel Metropole Company, Limited	1904	$200,000	2,000	$100	$100	*i* $208,386 *e* $50,000	.....$5,070	31-12-05	80 cents for 1905.....	12-2-06	7	$11¾
Humphreys' Estate & Finance Co., Ld.	1887	$1,500,000	150,000	$10	$10	none	.....$574	31-12-05	$2½ for 1905.....	7-2-06	7	$35
Kowloon Land and Building Co., Ld. ..	1889	$300,000	6,000	$50	$30	T909,593 *e* T170,000	.....$52,194	31-12-05	Final of Tls. 3 making T6 for 1905	23-2-06	5¼	T112 buyers
Shanghai Land Investment Co., Ld.....	1901	T2,600,000	52,000	T50	T50	none	..... T474	31-12-05	Final of Tls. 2½ making Tls.5 for'05	20-2-06	12¾	T42½ ex div.
Tientsin Hotel des Colonies, Ld.	1903	T70,000	1,400	T50	T50	*i* T67,300	..... T725	31-12-04	Final of Tls. 5 making Tls. 8 for'05	24-2-06	7¼	T110 ex div.
Tientsin Land Investment Co., Ld.....	1902	T772,600	7,726	T100	T100	none	..... $772	31-12-05	Final of $1.90 making $3.65 for'05	2-2-06	7	$53
West Point Building Co., Ld.	1889	$625,000	12,500	$50	$50							
Cotton Mills.												
Ewo Cotton Spinning and Weaving Co., Ld.	1895	T1,000,000	*(5)* 20,000	T50	T50	T45,939	.....T100,000	31-10-05	T8 for year ended 31-10-1905.....	18-12-05	13½	T59 buyers
Hongkong Cotton Spinning, Weaving and Dyeing Co., Ld.....	1901	$1,250,000	125,000	$10	$10	*e* $30,000	.....$23,264	31-7-05	$1 for year ended 31-7-1905.....	4-9-05	6¾	$15 buyers
International Cotton Manufacturing Co., Ld.	1895	T750,000	*(6)* 10,000	T75	T75	T100,000	.....T18,718	30-9-05	Interim of 3 % a/c 1898.....	30-4-98	—	T60 sales
Laou-kung-mow Cotton Spinning & Weaving Co., Ld.	1895	T800,000	*(7)* 8,000	T100	T100	none	.....T30,760	31-12-05	Tls. 8 for 1905	21-2-06	12	T67 sales
Soey Chee Cotton Spinning Co., Ld.....	1895	T1,000,000	2,000	$500	T500	T5,658	.....T22,051	31-12-04	4 % for 1895.....	2-2-88	—	T275 buyers
Miscellaneous.												
Anglo German Brewing Co., Ltd.	1904	$100,000	4,000	$100	$100	none	..... $1,066	31-12-05	$7 for 1905	1-3-06	7½	$93 ex div.
Bell's Asbestos Eastern Agency, Ld.....	1895	£5,377.10*s*	8,604	12/6	12/6	£314	..... £770	31-12-04	1*s*. 3d per share for 1904.....	21-7-05	9	$7 buyers
Campbell, Moore & Co., Ld.....	1886	$12,000	1,200	$10	$10	$8,000	.....$1,182	31-12-04	$3 for 1904	1-4-05	8¼	$36
China-Borneo Co., Ld.....	1903	$720,000	*(8)* 60,000	$12	$12	none	—	31-12-04	$1 for 1904	17-3-05	10	$10 sellers
China Flour Mill Co., Ld.	—	T200,000	4,000	T50	T50	T30,000	.....T718	31-12-04	Interim of T5 for 1905	24-7-05	—	T87½ buyers
China Light and Power Co., Ld.	1901	$500,000	50,000	$10	$10	none	.....$3,739	29-2-04	None.....	—	—	$10
China Provident Loan and Mortgage Co., Ld.	1898	*a* $1,000,000	100,000	$10	$10	$10,000	.....$4,791	31-12-05	80 cents for 1905.....	22-1-06	9	$9 sales
Dairy Farm Company, Ld.....	1896	$187,500	25,000	$7½	$6	$25,000	.....$2,864	31-7-05	$1.20 for year ending 31-7-1905	24-11-05	7¾	$15½ buyers

STOCK	WHEN ESTAB-LISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation*	CLOSING QUOTATIONS
Miscellaneous.—Continued											PER CENT	
Green Island Cement Co., Ld	1889	$1,500,000	150,000	$10	$10	*p* $410,000 / $500,000	..... $52,291	31-12-05	$2 div. & 50 cents bonus for '05.....	26-2-06	6¼	$30 ex div. & b.
Hall & Holtz, Ld.	—	$420,000	21,000	$20	$20	$186,000	..... $7,551	29-2-05	Final of $1½ making $2½.....	15-4-05	10	$25 sales
Hongkong Electric Co., Ld.	1889 / 1899	$600,000	30,000 / 30,000	$10 / $10	$10 / $10	none	..... $2,151	30-4-05	$1 00 / 50 cents for year ending 30-4-05	17-7-05	6 / —	$16½ buyers / $16
Hongkong High-Level Tramways Co., Ld.	1887	$125,000	1,250	$100	$100	$50,000	..... $2,796	30-11-04	$15 for year ending 30-11-04.....	24-12-04	7	$215 buyers
Hongkong Ice Company, Ld.	1881	$125,000	5,000	$25	$25	*k* $80,000	..... $3,776	31-12-05	Final of $15 making $19 for 1905....	16-2-06	8	$235
H'kong Rope Manufacturing Co., Ld..	1883	$500,000	10,000	$50	$50	$60,000	..... $11,173	31-12-04	$10 for 1904	10-4-05	7	$152 buyers
Hongkong Steam Waterboat Co., Ld....	1900	$150,000	15,000	$10	$10	$2,500	..... $88	30-9-05	Final of 50 cents making $1 for year ended 30-9-1905.....	24-11-05	10	$10 sales
Lane, Crawford & Co., Ld. (Shanghai).	1903	$250,000	2,500	$100	$100	none	..... $42,009	29-2-05	Interim of $5	20-11-05	9½	$145 buyers
Maatschappij tot Mijn-, Bosch-en Landbouwexploitatie in Langkat	1902	Gs.2,500,000	25,000	G.100	G.100	*i* T528,210 / T19,465	..... T35,849	31-10-04	4th quarterly dividend of T7½ making in all T22½ for '05 ...	15-12-05	9½	T232½ sales
Mondon, (E. L.) Ld.....	1902	T350,000	7,000	T50	T50	none	*Dr.* T117,638	31-12-04	T5 for 1902	2-5-03	—	T25
Philippine Company, Ld.....	1904	$675 000	67,500	$10	$10	none	*Dr.* P53,619	31-12-04	None.....	—	—	$5¼ buyers
Shanghai and Hongkong Dyeing and Cleaning Co., Ld.	1903	$60,000	1,200	$50	$50	none	*Dr.* $16,455	31-8-05	None.....	—	—	$50
Shanghai Gas Co., Ld.	1903	T800,000	16,000	T50	T50	*d* T145,000 / T108,172	..... T8,011	31-12-04	Interim of T3½ for 1905.....	26-7-05	7	T130 buyers
Shanghai Horse Bazaar Co., Ld.	1904	T270,000	5,400	T50	T50	T45,000	..... T9,751	31-12-04	T6 for 1904	17-3-05	9	T67½ sales
Shanghai Pulp and Paper Co., Ld.	—	T450,000	4,500	T100	T100	T37,000 / *e* T8,000	..... T2,753	31-12-04	Final of T8 making T14 for 1905.....	27-2-06	9	T157 ex div.
Shanghai Sumatra Tobacco Co., Ld.....	1902	T600,000	(9) 30,000	T20	T20	T24,820 / *w* T25,000	..... T1,297	31-10-04	Interim of T2	20-10-05	—	T60 sellers
Shanghai Waterworks Co., Ld.....	1881	£288,000	7,200 / 7,200	£20 / £20	£20 / £5	T170,000	..... T17,220	31-12-04	Interim of 15/- for 1905	27-7-05	—	T510 cum new
South China Morning Post, Ld.	1903	$150,000	6,000	$25	$25	none	*Dr.* $5,068	29-2-05	First year..... None	— —	— —	T170 buyers $20 sellers
Steam Laundry Co., Ld.....	1902	$100,000	20,000	$5	$5	none	..... $1,134	31-5-05	50 cents for year ended 31-5-05.....	20-11-05	8¼	$6
Straits Ice Company, Ld.	1884	$200,000	2,000	$100	$100	$25,000	..... $700	31-12-04	$5 account 1905.....	...-2-05	—	$160 buyers
Tientsin Waterworks Co., Ld.....	1901	T. T200,000	2,000	T. T100	T. T100	T15,259 / *e* T4,000	..... T1,012	30-4-05	Final of T4½ making T8½ for '04/5.	17-6-05	7¾	T. T110
United Asbestos Oriental Agency, Ld. / Do. do (Founders')	1896	$100,000	9,900 / 100	$10 / $10	$4 / $10	$22,000	..... $551	31-5-05	80 cents / $19.80 for year ended 31-5-05..	29-7-05	9 / 11	$9 $180
Watson (A. S.) & Co , Ld.....	1886	$900,000	90,000	$10	$10	$300,000	..... $6,096	31-12-04	Interim of 50 cents for 1905.....	25-11-05	7¾	$13 buyers
William Powell, Ld.....	1901	$150,000	15,000	$10	$10	*e* $4 500	.....$676	30-6-05	Final of 70 cents making $1.20.. for year ended 30-6-05.....	2-10-05	10½	$11¼

LOANS AND DEBENTURES	AGENTS FOR THE LOAN	AMOUNT OF LOAN	PAR VALUE	OUT-STAND'G BONDS	WHEN PAYABLE	CLOSING QUOTATIONS
China Government, 7 per cent. Silver Loan 1886 E.....	Hongkong & Shanghai Bkg. Cor.	T767,200	T250	1914	Mar. 31st & Sept. 30th each year until Mar. 31st, 1917.	par.
Hongkong Hotel Co., Ltd., 6% Mortgage Debentures of 1899‡.....		$500,000	$500	‰ all	Half yearly, June 30th and December 31st	par.
Shanghai & Hongkew Wharf Company, Ltd. 6% Debentures of 1902		T543,900	T100	.....	Half yearly, June 30th and December 31st.....	T97
Astor House Hotel Co., Ltd. 8% Debentures of 1903.....		T500,000	T100	.....	Half yearly, January 1st and July 1st.....	T104
Chinese Engineering & Mining Co., Ltd., 6% Debentures of 1903†	.....	£500,000	¶	£431,960	Half yearly, June 30th and December 31st.....	par.
International Cotton Manufacturing Co., Ltd. 6% Debentures of 1901.....	Russo Chin. Bk.	T500,000	T100	‖	Half yearly, March 31st and September 30th.....	par.

Plus accrued interest

a Authorized capital $2,000,000
b Building Reserve Account.
c Capital Reserve Fund.
d Depreciation Fund.
e Equalization of Dividend Fund.
f Exchange and Investment Fluctuation Account.
g Gold Reserve Fund
h Exchange Reserve Account.
i Insurance Fund.
j Reinsurance Fund.
k Contingencies Account.
l Legal Reserve Fund.
m
n Sinking Fund.
o
p Premium on New Issue.
q
r Repairs and Renewals Account.
s Silver Reserve Fund.
t
u Underwriting Suspense Account.
v
w Special Works Funds.
x Extra Reserve Fund.
y 75,000 owned by the Company
z 6,000 shares unissued.
1 5,725 shares unissued.
2 First issue of 60,000 of which 10,411 unalloted.
3 5.000 shares unissued.
4 7,600 shares unissued.
5 5 000 shares unalloted.
6 1,616 shares unalloted.
7 842 shares unissued.
8 14,000 shares unissued.
9 17,000 shares unissued.
* Based on last year's dividend.
‖ Only Tls. 134,000 taken up.
‰ 216 held by the Company
¶ In certificates of £20 and £100
‡ Redeemable in 10 years, or at option of Company the Company giving 6 months' notice.
† Redeemable at par at rate of £10,000 per annum from 31st December,
Dr. Deficit.

COURTESY MESSRS. FRASER & CO., BROKERS, SINGAPORE, MARCH, 1906.

NAME	DATE OF FORMATION	CAPITAL	CAPITAL PAID UP	NO. OF SHARES	ISSUE VALUE	PAID UP	RESERVE	LAST DIVIDEND	SINCE LAST MAIL HIGHEST	SINCE LAST MAIL LOWEST	CLOSING QUOTATIONS
Mining.									$	$	$
Bersawah Gold Mining Co., Ltd.	1900	$175,000	140,000	10,000 *1*	10	10	.....	.....	14.50	14.00	14.00 sellers
" " " " " *Deferred.*				4,000	10	10	.....	.....	.....	.....	8.00 sellers
Bruseh Hydraulic Tin Mining Co., Ltd.	1901	$600,000	600,000	60,000	10	10	.....	.....	9.50	9.00	9.50 sales
Kadana Gold Mining Co., Ltd.	1901	$300,000	300,000	20,000	10	10	.....	.....	.....	.....	2.00 sellers
" " " " " *Pref.*				10,000	10	10	.....	.....	.....	.....	10 00 nominal
Kechau Goldfields, Ltd. *Fully paid*	1902	£30,000	16,175.7/-	6,207	1	1	.....	.....	.....	.....	in liquidation
" " " *Contrib*				10,493 *2*	1	19/-	.....	.....	.....	.....	in liquidation
Kuantan Tin Mining Co., Ltd.	1905	$150,000	99,000	9,900 *3*	10	10	.....	.....	.....	.....	12.50 buyers
Pahang Corporation, Ltd.	1889	£250,000	244,306	244,306 *4*	1	1	20,000	3% for year ending 30 6-02	.....	.....	1.25 sales & buyers
Pahang Kabang, Ltd.	1890	£375,000	375,000	360,000	1	1	.....	.....	0.25	0.20	0.20 sales & buyers
" " " *Pref.*				15,000	1	1	.....	.....	.....	.....	..... nom.
Queensland Raub G.M.Co., Ltd. *Fully paid*	1901	£146,700	100,866	36,700	1	1	.....	.....	.....	.....	..... nom.
" " " " *Contrib*				110,000	1	11/8	.....	.....	.....	.....	..... nom.
Raub Aust. Gold Ming. Co., Ltd. *Fully paid*	1892	£200,000	191,250	50,000	1	1	4,873	1s. paid January, '01	.....	.....	2.00 sellers
" " " " *Contrib.*				150,000	1	18/10	.....	1s. " " "	.....	.....	2 00 sellers
Redjang Lebong Mining Co.	1898	*f.*2,000,000	1,800,000	18,000 *5*	100	100	.....	22 9-10% for year ending 31-12-04	.....	.....	385 00 sales
Royal Johore Tin Mining Co., Ltd.	1900	$220,000	220 000	22,000	10	10	.....	5 " for year ending 15-2-04	.....	.....	3.00 sellers
Sipiau Tin Co., Ltd.	1899	$230,000	230,000	23,000	10	10	.....	5 " for ½ year ending 30-6-05	.....	.....	7.00 sales & sellers
The Belat Tin Mining Co., Ltd.	1903	$300,000	300,000	30,000	10	10	.....	.....	.....	.....	3.00 sellers
The Pusing Lama Tin Mines, Ltd.	1904	£120,000	98,000	98,000 *6*	1	1	.....	6d. paid February, 1906	.....	.....	10.80 sellers
Tronoh Mines, Ltd.	1902	£160,000	149,185	149,185 *7*	1	1	.....	7s. paid during 1905	.....	.....	17.50 sales
Duff Development Co., Ltd	1903	£400,000	350,000	350,000 *8*	1	1	.....	.....	.....	.....	7.00 sellers
Rubber.											
Anglo-Malay Rubber Co., Ltd.	1905	£150,000	140,000	140,000 *9*	1	1	.....	.....	.....	.....	£1 12s 6d
Balgownie Rubber Estate Ltd.	1905	$200,000	100,000	20,000	10	5	.....	.....	11.50	10.50	$11.50 sales
Batu Caves Rubber Co Ltd. *Fully paid*	1904	£30,000	11,125	7,000 *10*	1	1	.....	.....	.....	.....	.....
" " " " *Contrib.*				11,000	1	7/6	.....	.....	.....	.....	£1 0s od.
Bukit Rajah Rubber Co. Ltd *Fully paid*	1903	£70,000	59,250	54.000 *11*	1	1	.....	.....	.....	.....	£3 15s. od. .....
" " " " *Contrib.*				7,000	1	15/-	.....	.....	.....	.....	£3 10s. od.
Cicely Rubber Estates Co.. Ltd.	1904	£12,000	10,500	6,000	1	1	.....	.....	.....	.....	£2 5s. od.
" " " 5% Pref.				6,000	1	15/-	.....	.....	.....	.....	£2 5s. od. .....
Consolidated Malay Rubber Estates, Ltd.	1905	£75,000	55,000	55,000 *12*	1	1	.....	.....	.....	.....	£1 17s. 6d. .....
Sione Rubber Company. Ltd.	1905	$100,000	88,000	8,800 *13*	10	10	.....	.....	.....	.....	$18.00
Sungei Way (Selangor) Rubber Co., Ltd.	1904	£50,000	15,670	6,920 *14*	1	1	.....	.....	.....	.....	£2 os. od. buyers
" " " *Contrib.*				35,000	1	5/-	.....	.....	.....	.....	£1 4s. od. .....
The Batu Unjor Rubber Co., Ltd.	1905	$700,000	610,000	61,000 *15*	10	10	.....	.....	24.00	22.00	$22.00 sales & sellers
The Pataling Rubber Estates Syndicate Ltd	1903	£30,000	20,000	20,000 *16*	1	1	.....	.....	.....	.....	£5 os. od. buyers
The Ribu Planting Co., Ltd.	1904	$200,000	135,000	1,350 *17*	100	100	.....	.....	.....	.....	$270.00 .....
The Sandycroft Rubber Co. Ltd.	1904	$100,000	85,000	850 *18*	100	100	.....	.....	.....	.....	$245 00 sales
The Selangor Rubber Co., Ltd.	1898	£30,000	26,300	26,300 *19*	1	1	.....	.....	.....	.....	£7 15s. od. .....
The Singapore & Johore Rubber Co., Ltd.	1903	$100,000	91,500	150	100	100	.....	.....	.....	.....	$185.00 .....
" " " " " " *Contrib*				850	100	90	.....	.....	.....	.....	$175.00 .....
Vallambrosa Rubber Co., Ltd.	1904	£60,000	50,000	50,000 *20*	1	1	.....	.....	.....	.....	£5 os. od. .....
General.											
Fraser & Neave, Ltd.	1898	$225,000	225,000	4,500	50	50	112,500	10 p. ct. and 2½ per cent bonus for '04	105.00	104.00	105.00 sales
Hogan & Co., Ltd.	1904	$480,200	334,800	3,348 *21*	100	100	5,000	7 per cent for 1904	.....	.....	40.00 sellers
H'kong and Shanghai Banking Corporation	1865	$10,000,000	10,000,000	80,000	125	125	10,000,000 *25*	35s. and 20/- bonus for ½ year ending 31-12-05	.....	.....	800.00 buyers
							9,500,000 *26*				
							250,000 *27*				
Howarth Erskine, Ltd.	1901	$2,400,000	18,000	100	100	.....	.....	.....	135.00	130.00	135.00 buyers
" " " 7% Pref.			6,000	100	100	.....	.....	.....	.....	.....	110.00 buyers
Maynard & Co., Ltd.	1901	$34,000	34,000	3,400	10	10	.....	15 p. ct. for year ending 31-10-05	.....	.....	23.00 sellers
Riley, Hargreaves & Co., Ltd.	1899	$875,000	875,000	6,000	100	100	150,000	10 p. ct. and 2½ p. ct. bon. for year '04	.....	.....	190.00 sales
" " " " 7% Pref.				2,750	100	100	.....	7 p. ct. for year 1904	.....	.....	115.00 buyers.
Singapore Cold Storage Co., Ltd	1903	$600,000	240,000	24,000 *22*	10	10	.....	.....	10.00	9.00	9.00 sales
Singapore Dispensary Ltd.	1891	$30,000	30,000	600	50	50	19,000	12½ per cent for year ending 31-7-04	.....	.....	70.00 sellers
Straits Ice Co., Ltd.	1884	$200,000	200 000	2,000	100	100	22,000	5 " interim for 1905	.....	.....	150.00 buyers
Straits Steam Ship Co., Ltd.	1890	$500,000	421,500	5,000 *23*	100	100	400,000	5 p. ct. interim for 1905	.....	.....	145.00 sales & buyers
							169.228 *28*				
Straits Trading Co., Ltd.	1887	$3,000,000	2,500,000	250,000 *24*	10	10	700,000	10 p.ct. & 5 p.ct. bon. ½ yr. end. 30-9 05	43.25	43.00	43.25 sales
							1,021,395 *29*				
Tanjong Pagar Dock Co., Ltd.	1864	$3,700,000	3,700,000	37,000	100	100	1,950,000	$6 for half year ending 31-12-05	.....	.....	500.00 sales
Debentures.		$									
Howarth Erskine Ltd. 6 per cent		600,000	.....	.....	.....	.....	.....	.....	.....	.....	3 per ct. prem. buyers
Singapore Municipal 6 "		400,000	.....	.....	.....	.....	.....	.....	.....	.....	3 ,, prem. buyers
" " 5 "		1,878,000	.....	.....	.....	.....	.....	.....	.....	.....	par buyers
" " 4 "		602,300	.....	.....	.....	.....	.....	.....	.....	.....	2 per ct. dis. nominal
Riley, Hargreaves & Co., Ld. 6 p. cent		225,000	.....	.....	.....	.....	.....	.....	.....	.....	2 ,, prem. buyers
Tanjong Pagar Dock Co., Ld. 6 "		250,000	.....	.....	.....	.....	.....	.....	.....	.....	2 ,, prem. buyers
" " " " 5 "		1,365.500	.....	.....	.....	.....	.....	.....	.....	.....	par buyers

1 3,500 unissued.
2 13,300 "
3 5,100 "
4 5,694 "
5 2,000 "
6 22 000 unissued
7 10,815 "
8 50,000 "
9 10,000 "
10 12,000 "
11 9,000 unissued
12 20,000 "
13 1,200 "
14 8,080 "
15 9,000 "
16 10,000 unissued Mort. £5,000
17 650 "
18 150 "
19 3,700 "
20 10,000 "
21 1,454 unissued.
22 36,000 "
23 785 "
24 50,000 "
25 Special Gold Reserve Fund.
26 Silver Reserve Fund.
27 Insurance Fund.
28 Sundry Reserves.
29 Sundry Reserves.

YOKOHAMA SHARE QUOTATIONS

COURTESY A. C. HUTTON POTTS, SHARE AND GENERAL BROKER, YOKOHAMA, DECEMBER, 1905.

STOCKS.	CAPITAL.	NO. OF SHARES.	ISSUE VALUE.	AMOUNT PAID UP.	RESERVE FUND.	AT WORKING ACCOUNT OR CARRIED FORWARD.	DATE.	LAST DIVIDEND.	FOR TERM.	CLOSING QUOTATION.
	Y.		Y.	Y.						
Brett & Co., Limited	28,000	2800	10	10			30/6/03	6%	for 1 year	7 Nominal.
Club Hotel, Limited	185,000	1850	100	100			31/3/04	7%	,, 1 year	55 Buyers.
Grand Hotel, Limited	250,000	2500	100	100		Y.6,179.25	31/12/05	10%	,, ½ year	225 Sellers.
Helm Bros., Limited	186,000	3720	50	50		Y.6,235.70	31/12/05	17½%	,, 1 year	80 Buyers.
Langfeldt & Co., Limited	150,000	1500	100	100		Dr.28,875.52	31/12/05		,, ½ year	45 Selles.
C. Nickel & Co., Limited	500,000	20000	25	25		5,106.41	31/10/05	12%	,, 1 year	35 Nominal.
Japan Brewery Company, Limited	450,000	9000	50	50	200,000	8,702.28	31/12/05	20%	,, 1 year	120 Buyers.
Yokohama Engine and Iron Works	130,000	2600	50	50	20,000	Y.20,149.17	30/11/05	10%	,, ½ year	120 Sellers.
Hirano Mineral Water Co., Ltd.	125,000	5000	25	25				1st year		25 Sellers.
Oriental Hotel, Ltd., Old Ordinary		1490	50	50			31/8/05	12%	,, 1 year	75 Nominal.
,, ,, New ,,		1510	50	25						
,, ,, Old Preference	251,000	750	50	50	60,542.50			8%	,, 1 year	63 Sales.
,, ,, New ,,		1250	50	25						
,, ,, Founders	G	80	12½	12½				Y.37	,, 1 year	500 Sales.
Oriental Consolidated Mining Co., Ltd	$5,000,000	500,000	G.$10	G. $10	none	G. $672,093	31/12/04	G. $1.	,, 1905	G. $18 Sellers.
Raub Australian Gold Mining Co., Ltd.	£200,000	150,000	£1	18/10	£4,873	*Dr.* £8,745	31/3/05	48 cts.	,, 1901	$5.10 Sales.
		50,000	£1	£1						

DEBENTURE LOANS.	AMOUNT OF LOAN.	FACE VALUE OF DEBENTURES.	RATE OF INTEREST.	INTEREST PAYABLE.	CLOSING QUOTATION.
Japan Brewery Company, Limited	200,000.00	100.00	7%	1 April and 1 October.	108 Sales.
Brett and Company, Limited	11,500.00	100.00	7%	1 June and 1 Dec.	95 Sellers.
Yokohama United Club	250,000.00	100.00	7%	30 June and 31 Dec.	108 Sales.
C. Nickel and Company, Limited	50,000.00	100.00	8%	1 May and 1 Nov.	110 Sellers.

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No. 85.

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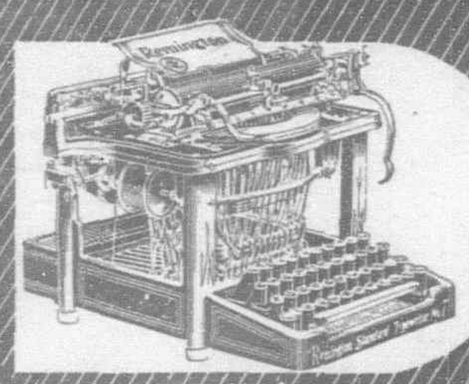
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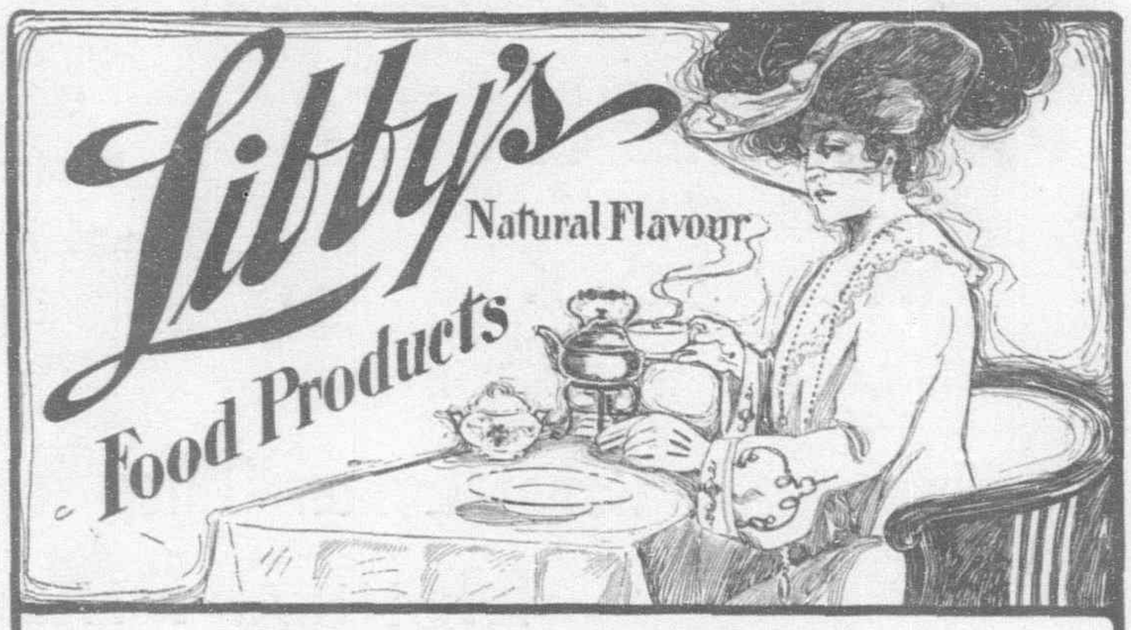
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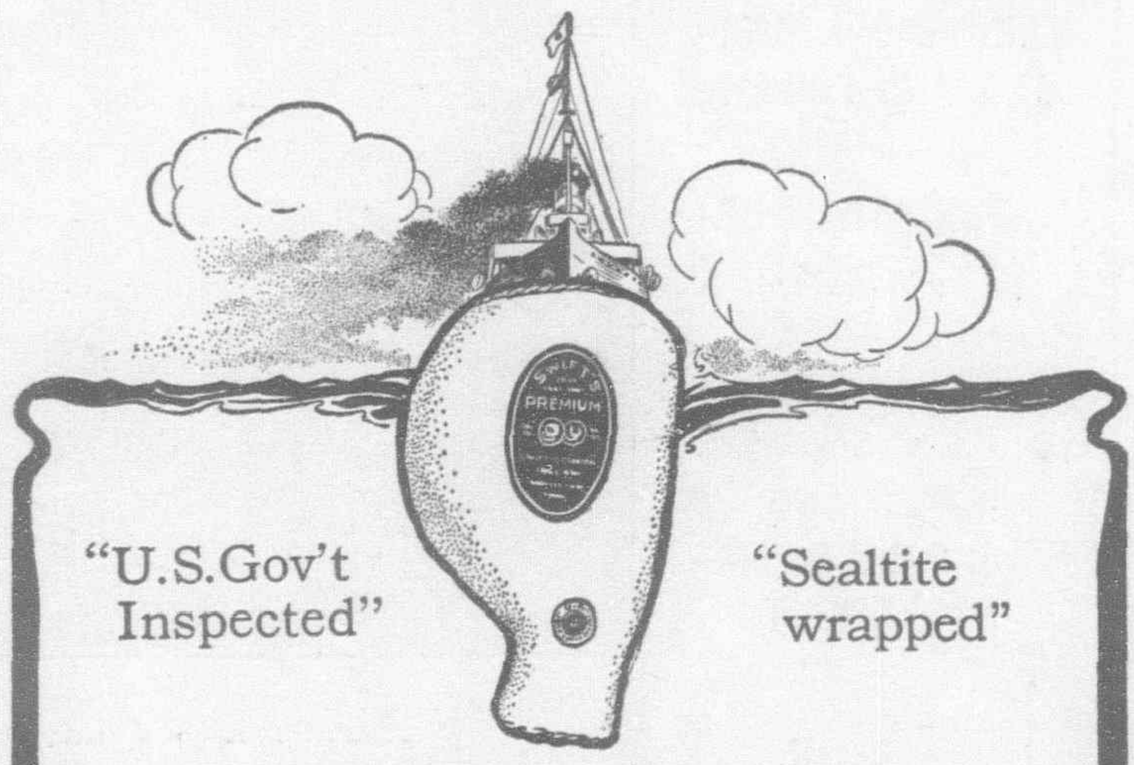
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No smoked meats equal Swift's Premium brands. Finest in quality because carefully selected from young corn-fed porkers, mild cured, smoked over slow burning hickory fires and then "Sealtite" wrapped so that both the Hams and Bacon reach you fresh, juicy and full flavored.

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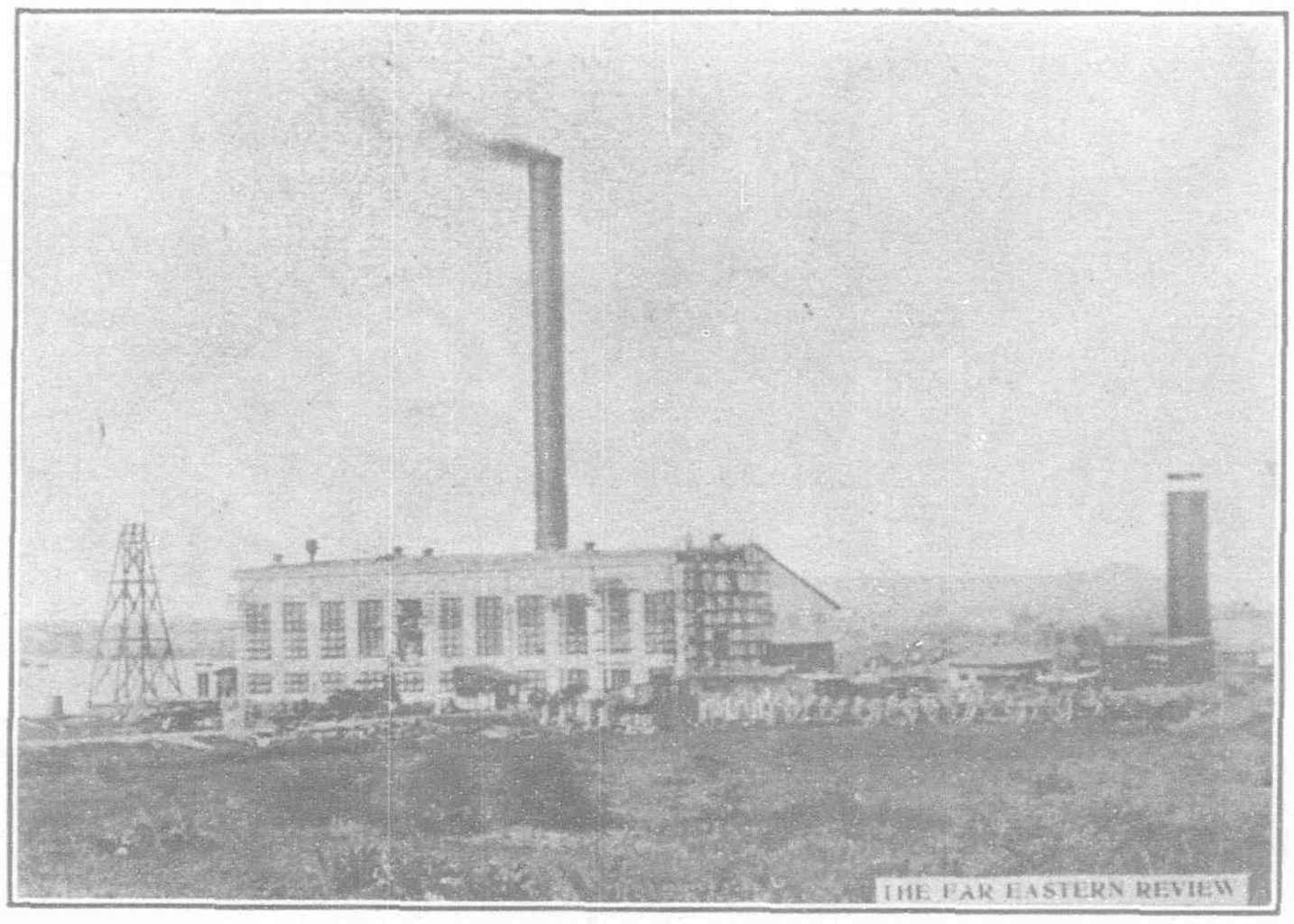
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WOOD BLOCK PAVING, ROSARIO AND ESCOLTA, MANILA.—COMPLETED

CONCRETE STEEL BRIDGE, MANILA—UNDER CONSTRUCTION

ILOILO HARBOUR IMPROVEMENT—UNDER CONSTRUCTION

CEBU HARBOUR IMPROVEMENT—UNDER CONSTRUCTION

TIMBER PIER AND WHARF, QUARTERMASTER'S DEPARTMENT, MANILA

ADVERTISEMENT

OFFICE OF THE MUNICIPAL BOARD, *Manila, P. I., March 15, 1906.*

Sealed bids or proposals will be received by the secretary of the Municipal Board until 11 a. m., September 15, 1906, and thereupon opened, for the purchase of the lease of a hotel site in the north wing of the Luneta Extension, city of Manila.

The site is approximately 500 by 600 feet, fronting on the new boulevard on the east, with the Luneta on the south, Manila Bay on the west, and the new commercial center and works of the port on the north.

Detailed information and blank forms of proposal may be obtained at the office of the secretary of the Municipal Board, Manila, P. I., or from the Chief of the Bureau of Insular Affairs, Washington, D. C.

Each bid will be accompanied by a certified check for ₱15,000 ($7,500, United States currency) as a guaranty that the bidder, if awarded the lease, will, after due notification, promptly enter into contract and furnish an acceptable bond in the sum of ₱20,000 ($10,000, United States currency) for the faithful fulfillment of the conditions of said contract.

The right is reserved to reject any or all bids, or to waive any defects.

JOHN M. TUTHER, *Secretary of the Municipal Board.*

INFORMATION FOR BIDDERS

An examination of the general plan of the City of Manila will show that the hotel location is advantageous from every point of view, being conveniently near the government and military offices and the large commercial interests which in the near future will be centered on the reclaimed area north of the site. Tourists will land from steamships within easy walking distance, and will be near such points of interest as the Luneta and the Walled City and the principal clubs. A hotel on this site would also have the advantages of a special landing place for launches, etc.

It is desired that the hotel be arranged around three sides on an open court, with its fourth side open toward the sea. In this way the maximum number of rooms would have a view toward the water. There should be not more than three full stories and there should be no cellar; low towers or roof gardens might be desirable. There should be about 200 bedrooms of an average size of 16 by 20 feet, and a clear height of at least 13 feet is necessary in this climate; while private baths and closets are desirable for the more expensive rooms and suites, a simple shower for each bedroom is almost essential.

While a hotel containing 150 to 200 rooms is desired immediately and would secure a full patronage, a scheme providing for the immediate construction and equipment of the central part, with the addition of the two wings projecting seaward in the future, would be considered. The central part should contain about 75 bedrooms.

The bulkhead inclosing the new Luneta Extension hotel and club sites was about two-thirds completed on January 15th. About March 1st the pumping of the dredged material commenced and will continue for six months, and the area will be completely reclaimed and filled and ready for building within twelve months at the outside.

To balance that part of the extension destined for hotel purposes, a similar extension, 600 feet in length by 300 feet in width, has been provided at the south end of the Luneta Extension adjoining the boulevard. A request is now before the Municipal Board from the Army and Navy Club of the City of Manila for the reservation of at least half this tract, on which it is proposed to erect a club building costing not less than ₱200,000 ($100,000, gold). Other requests have been received from the Elks Club, Manila Club, and University Club, for reservation of space on which it is proposed to commence the erection of suitable club buildings; hence it will be seen that the proposed improvements will not be delayed, and that the value of this section of the city will be vastly enhanced within the next five years.

The reclamation of the new commercial center adjoining the Luneta Extension, containing 840,000 square meters, has already been completed, and it is expected that within the present year the government will have perfected the plans for leasing or selling said ground for commercial purposes, and the building of offices and warehouses will be immediately undertaken.

The assessed valuation of that portion of the Luneta Extension reserved for hotel purposes is ₱16 ($8, United States currency) per square meter. The area is approximately 28,000 square meters.

Attached to this general information are two plans, the first one showing the entire City of Manila with the proposed improvements in all sections, including the water front, Luneta Extension, and boulevard.

The hotel site and principal buildings, places of amusement, hotels, etc., are noted and indexed. The second plan shows the City of Manila and the extension of the projected boulevard to Cavite. From these plans it will be seen that the new commercial center and the Luneta Extension, with the hotel reservation and the club reservations, have passed from the condition of projected improvements into real accomplishments. The construction of the boulevard will be undertaken as soon as the city has funds available for the work.

In the general growth of the city careful attention is being paid to the plans of Mr. D. H. Burnham. In this connection the following extracts are taken from the report of Mr. Burnham, in the hope that it may be useful in indicating the lines of progress:—

POPULATION.—The present population of Manila is given, in the report of the Municipal Board for 1903, as 223,029. Owing to the probable active development of industry and agriculture in the near future, the population of Manila may be expected to increase rapidly, and the introduction of surface transportation will ultimately scatter this enlarging population over a greater territory than that inclosed by the present city limits. For the purpose of this report, however, no reference will be made to the territory outside those limits except in connection with parks and parkways, summer resorts, and country clubs.

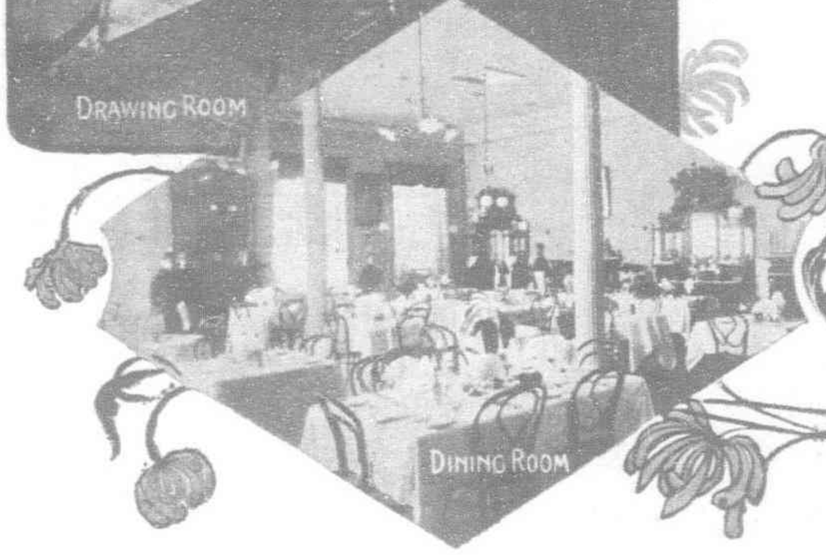
NEW LUNETA.—The present Luneta, being covered by the government group to be described later, is replaced by a new Luneta of the same size and shape and placed about 1,000 feet farther out in the bay on the new-made land. The objects of carrying the Luneta farther out are to restore its former commanding outlook, partially cut off by the new works of the port, and also to form a large pleasure park near the center of town and on the water front. This park, together with the Government plaza east of it, forms a natural starting point for the bay-front boulevard and its extensions eastward and northward around the Walled City. The level of the new Luneta is slightly below that of the adjoining park, from the balustrades of which the spectator will have a view of the Luneta and a fine prospect over it toward the sea. The existing Luneta plays such an admirable rôle in the social life of Manila that its advantages should be preserved unchanged. To this end the new Luneta, like the present one, is left without planting of any sort on its westward side so as to give an unobstructed view of the sea. The other three sides are inclosed with a double row of trees in order partially to shut in the Luneta, to provide protection from the sun, and also in order to let the bay be seen from the park through a screen of foliage.

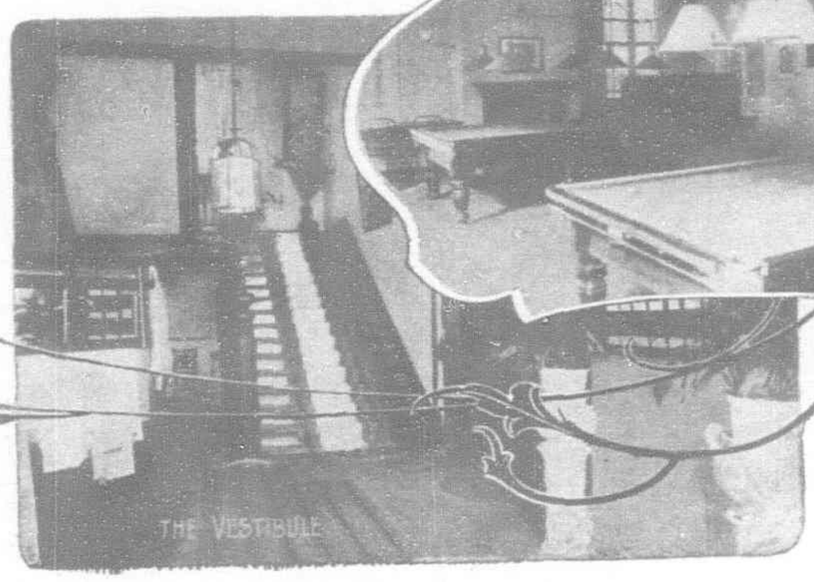
MASONRY CONSTRUCTION.—In a tropical climate costly structures put up with granite, marble, or other building stones in the manner of public buildings in Europe and America would be out of place. Flat walls, simply built of concrete (with steel reenforcing rods to resist earthquake), and depending for their effect upon beautiful proportions rather than upon costly materials, are from all points of view most desirable for Manila. The old Spanish buildings with their relatively small openings, their wide-arched arcades, and large wall spaces of flat whitewash possess endless charm, and as types of good architecture for tropical service could hardly be improved upon.

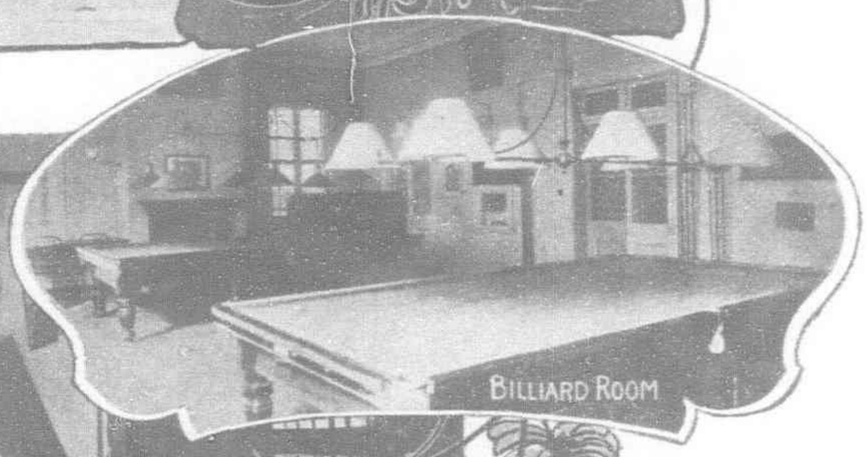
NEW HOTEL.—To the north of the Luneta Park is a space approximately 500 by 600 feet, reserved for a hotel whose size, surroundings, and appointments are intended to deliver Manila once for all from the standing reproach of inhospitality toward a traveler. A hotel on a sufficient scale in this location could be made renowned the world over, and constitute in itself alone an attraction strong enough to draw to Manila every traveler in the Orient. With three sides fronting on parks and boulevards and the fourth side fronting the sea, the hotel site offers every possibility for a world-famous resort.





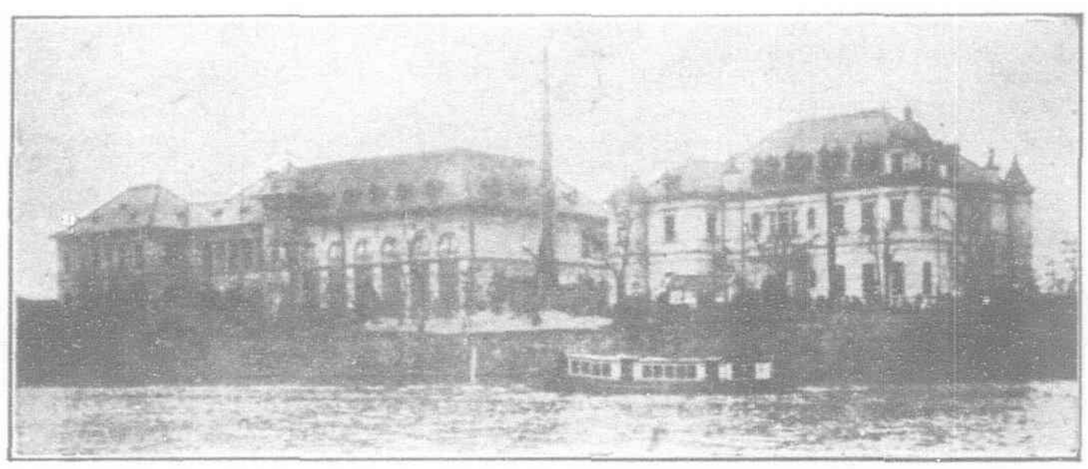






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Electric Light and Steam Heat Throughout
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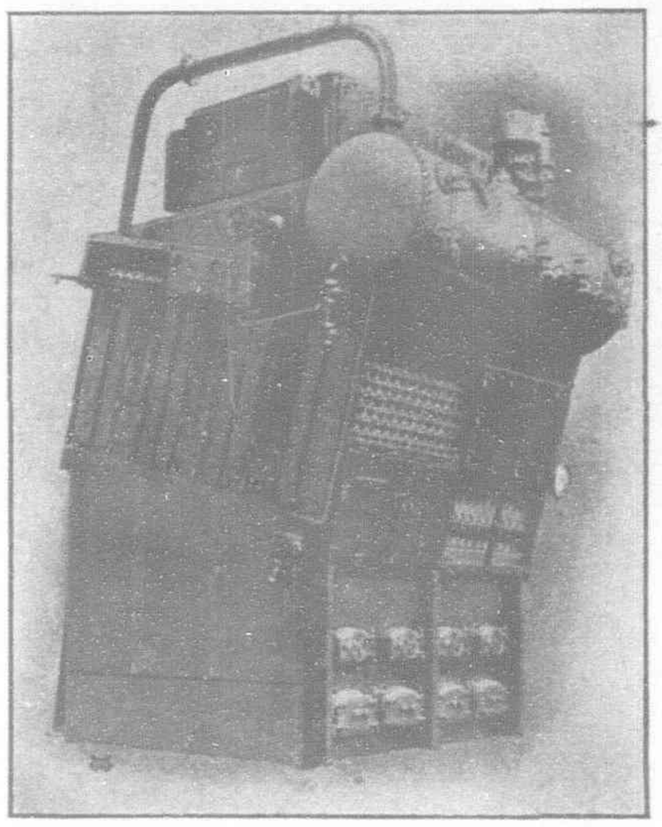
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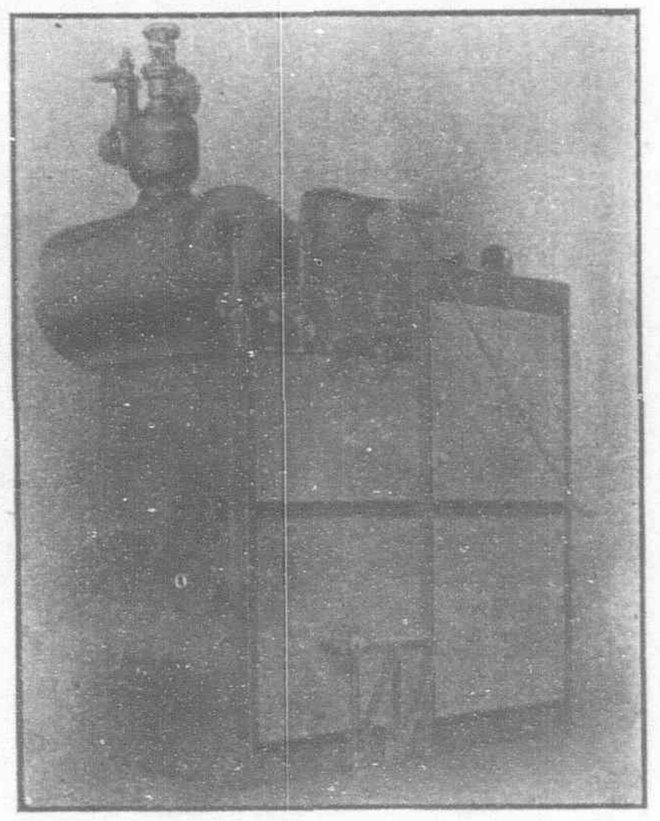


MARINE TYPE FOR LAND PLANTS

PATENT WATER-TUBE STEAM BOILERS

5,000,000 H. P. IN USE

Some installations in China:—
Electric Light Works, Hongkong.
Green Island Cement Works, Hongkong.
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Electric Light Works, Tientsin.
Electric Light Works, Pekin.
Electric Light Works, Hankow.
Pekin Syndicate Mines, Takoo.
S. Pearson and Son, Ltd., Railway Works and many others.



PORTABLE TYPE, REAR VIEW

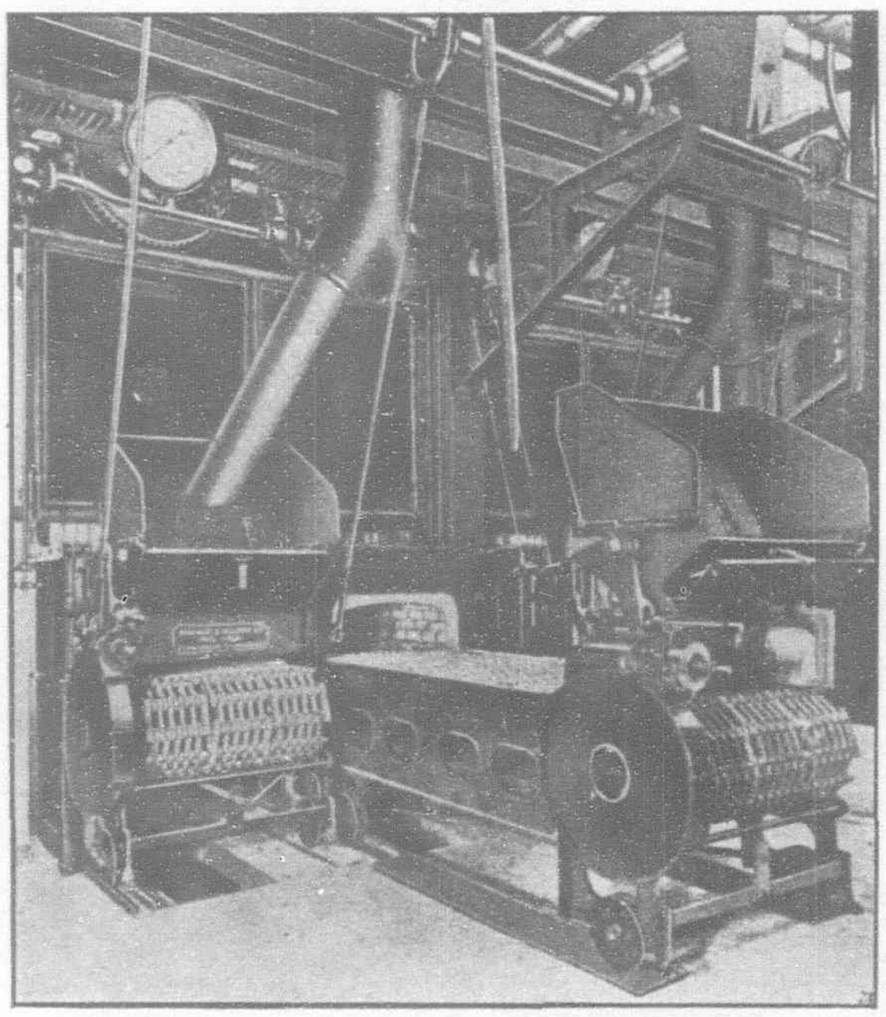
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Feed-Water Heaters.
Economisers.
Steam Piping.
Steel Chimneys.
Water Purifiers and Softeners.
Coal-Conveying Machinery.
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SMOKELESS COMBUSTION and **HIGH EFFICIENCY** with Bituminous Coal. Continuous Working, Low Cost of Upkeep, Self-Clinkering and Easy Manipulation.

Extract from 1904 Report of F. H. W. Aldridge, Municipal Electrical Engineer of Shanghai:

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Specially constructed for use in mountainous districts, and shipped in small packages of light weight, no parcel exceeding two hundred lbs. in weight for easy transport by Cart, Coolies or Mule-back.

Cross Type Boilers

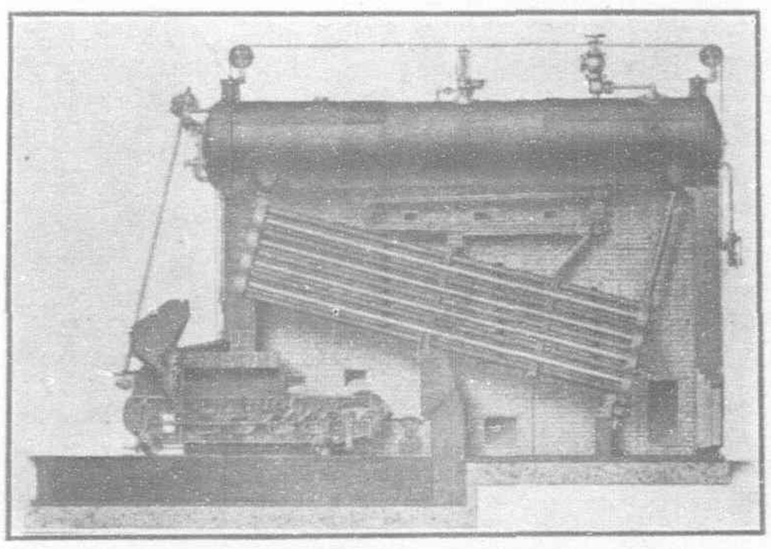
As supplied to the Pekin Syndicate Mines in Honan can be sectionalized so that no piece exceeds two hundred and fifty lbs. in weight.

Marine Boilers

Specially suitable for light draught and river steamers, where economy in weight and space is of importance.

Marine Type For Land Purposes

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PATENT WATER-TUBE LAND BOILER, FITTED WITH PATENT INTREGAL SUPERHEATER, AND PATENT MECHANICAL CHAIN GRATE STOKER

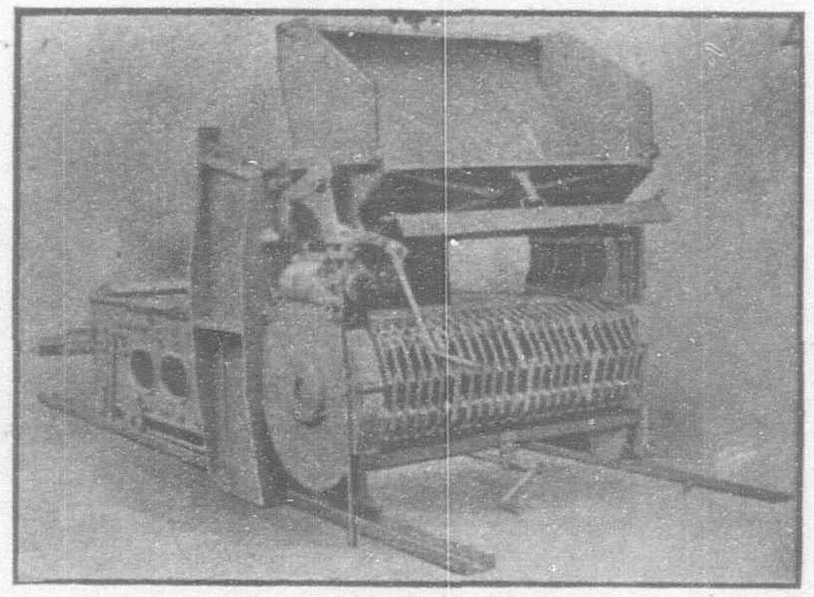
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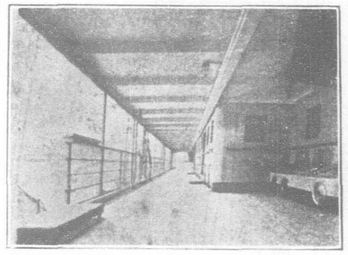
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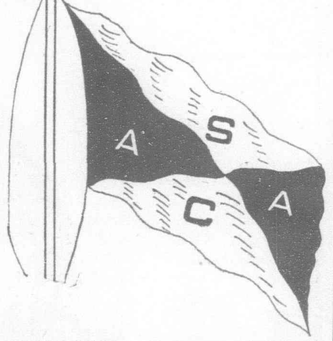
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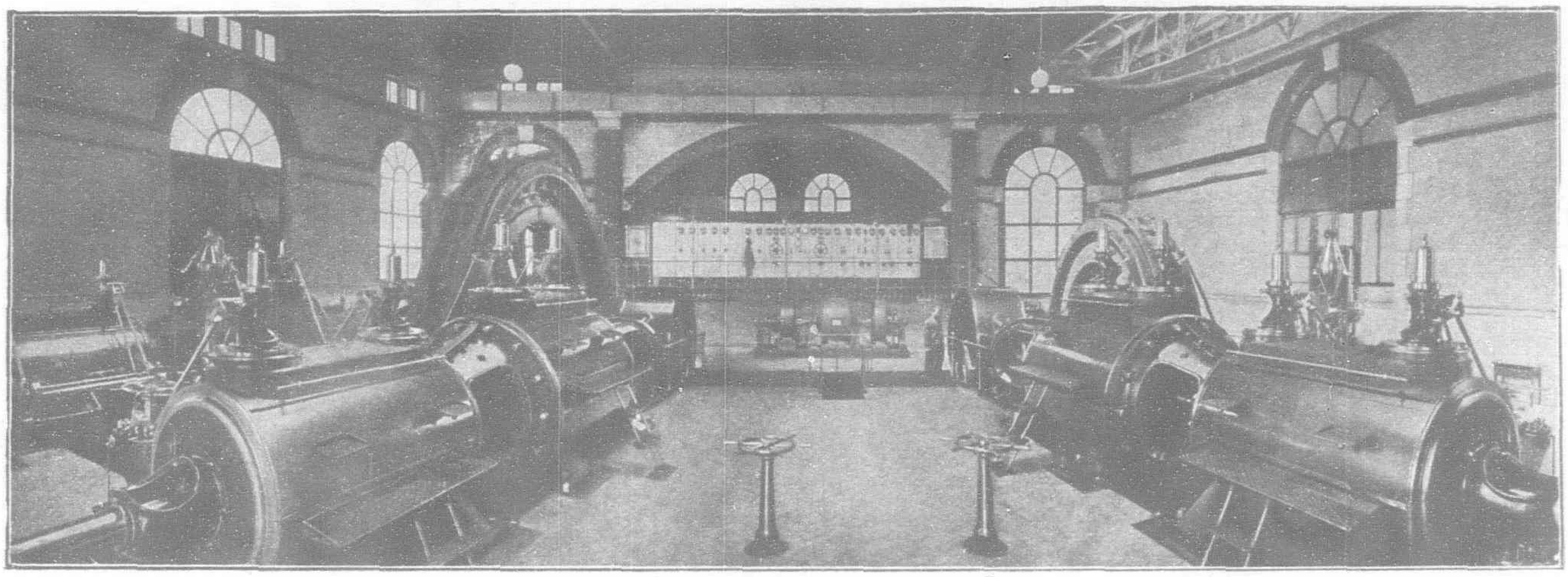
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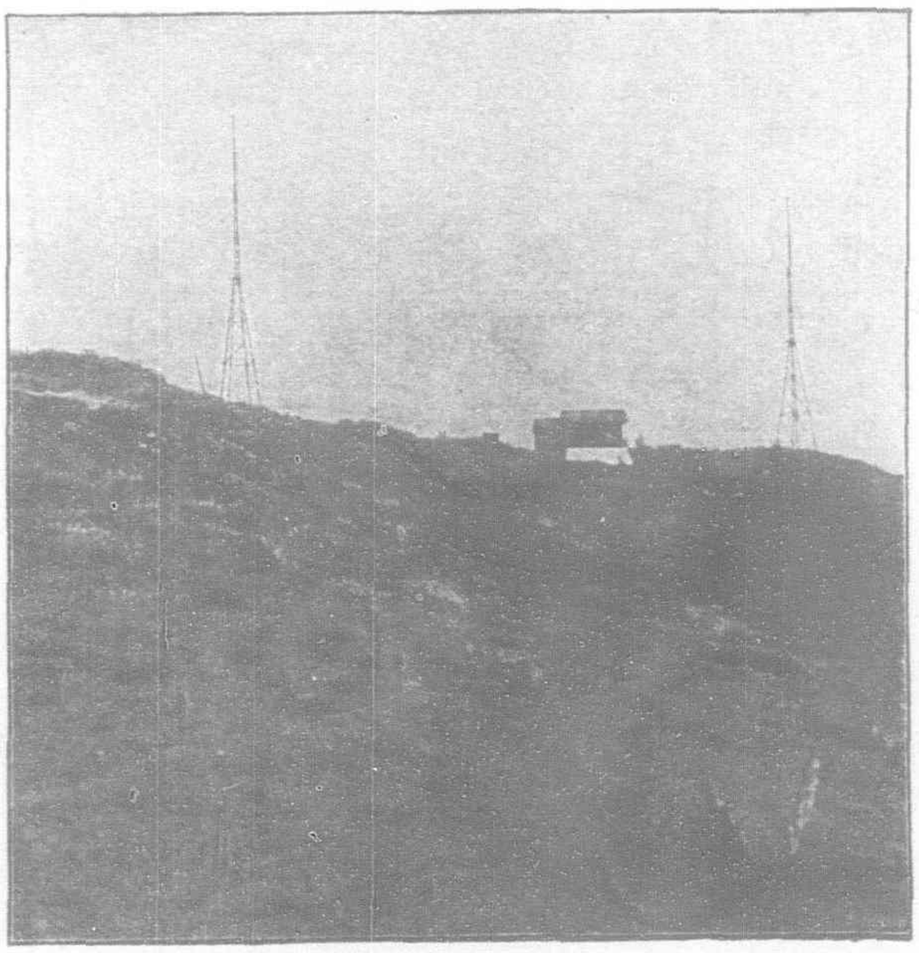
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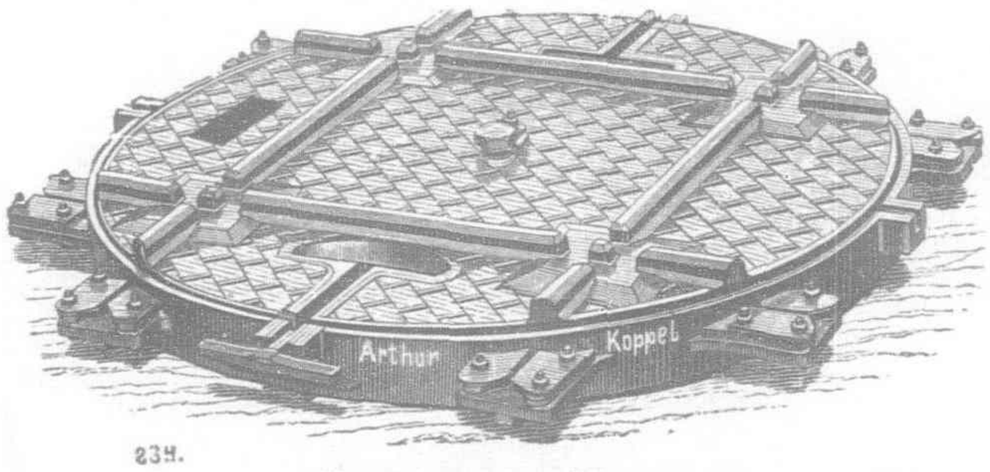
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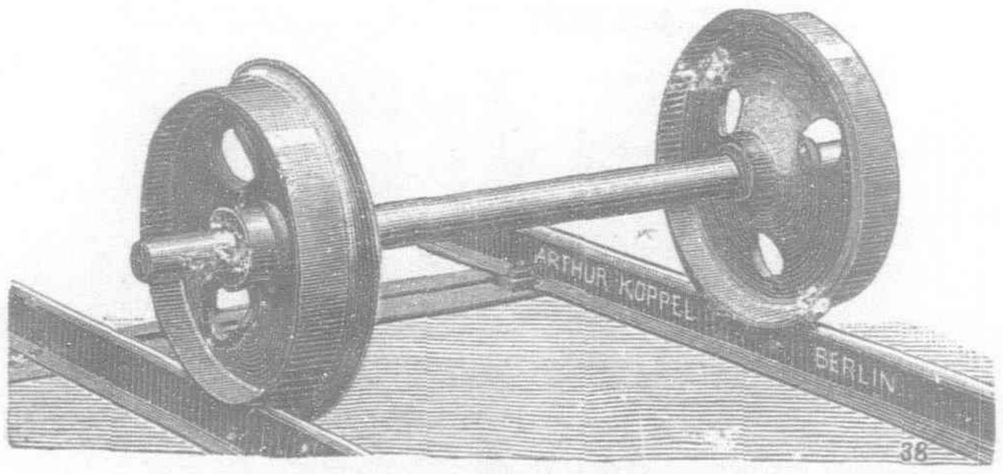
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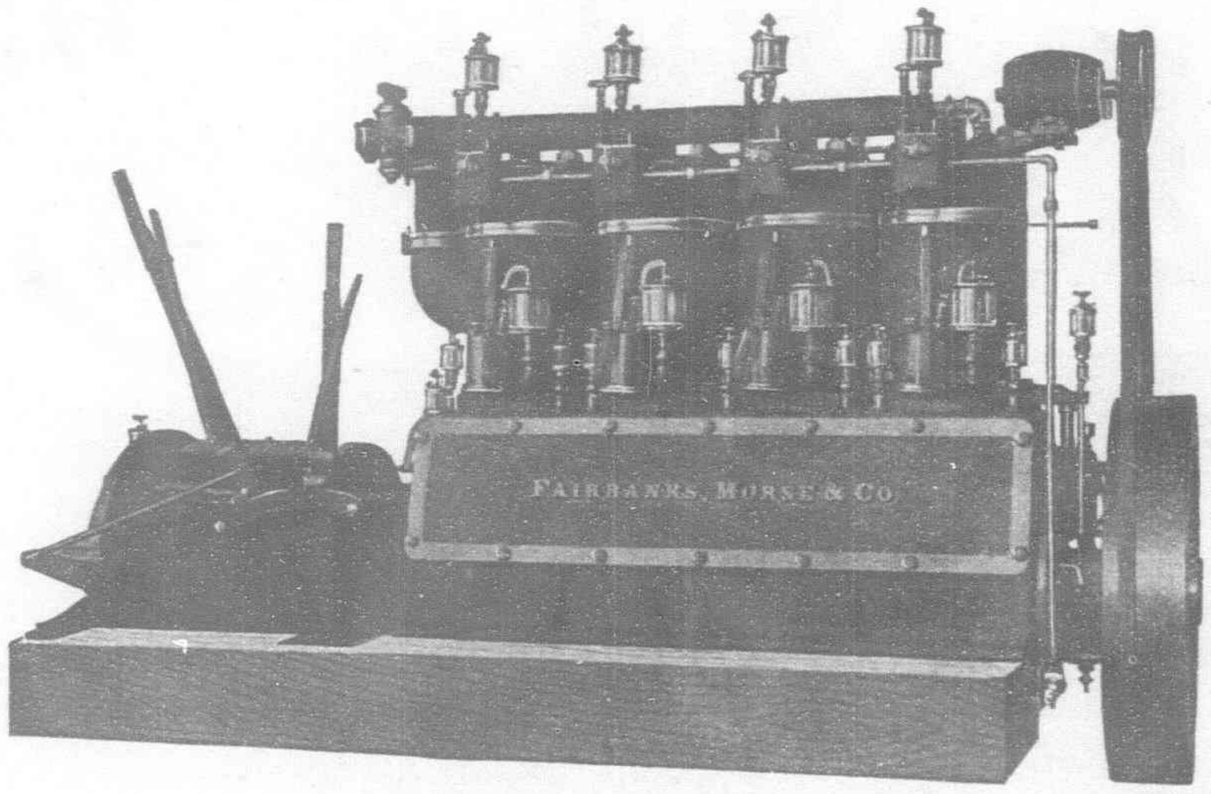


239.

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WHEELS AND AXLE



"Fairbanks-Morse"

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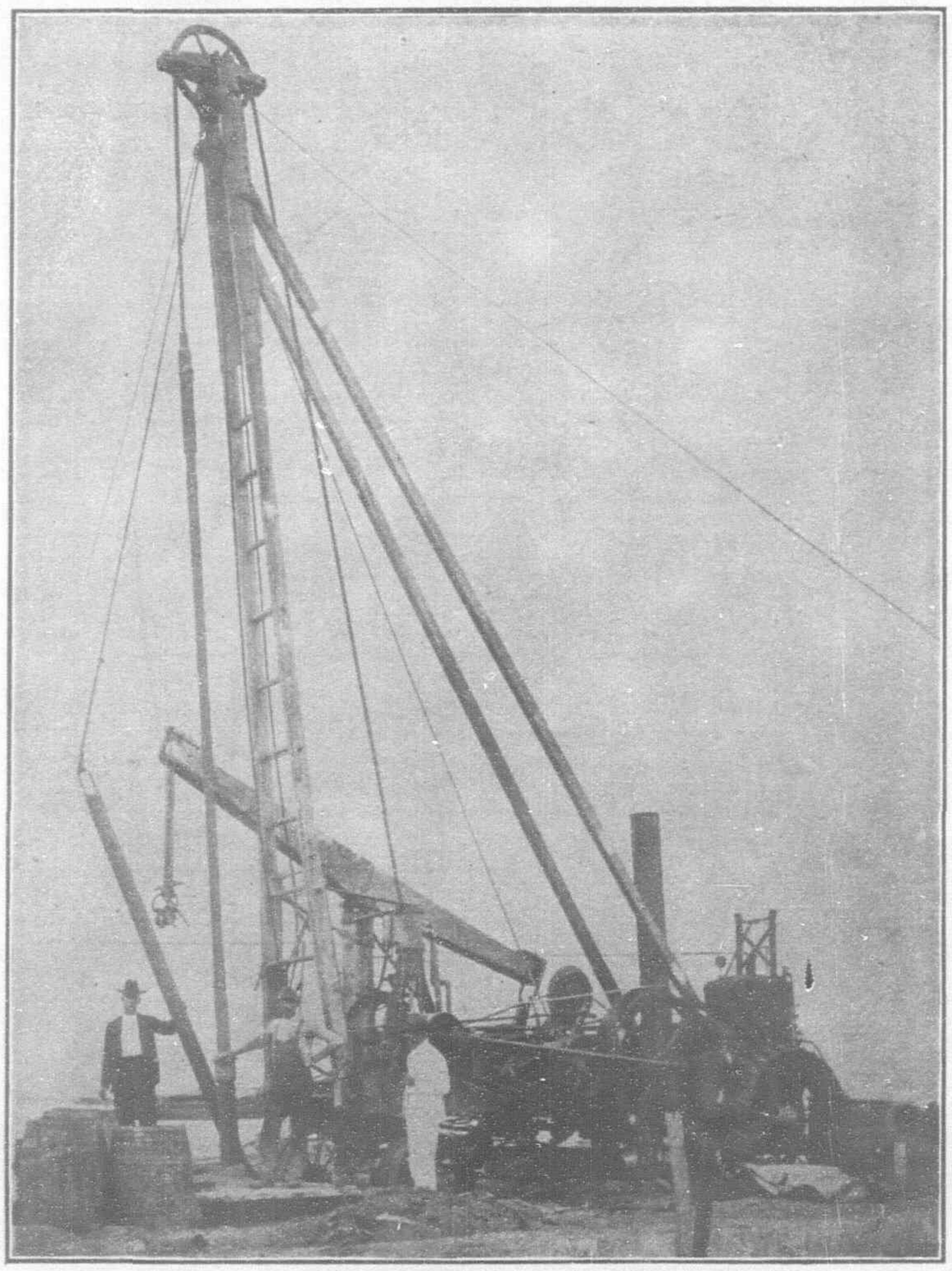
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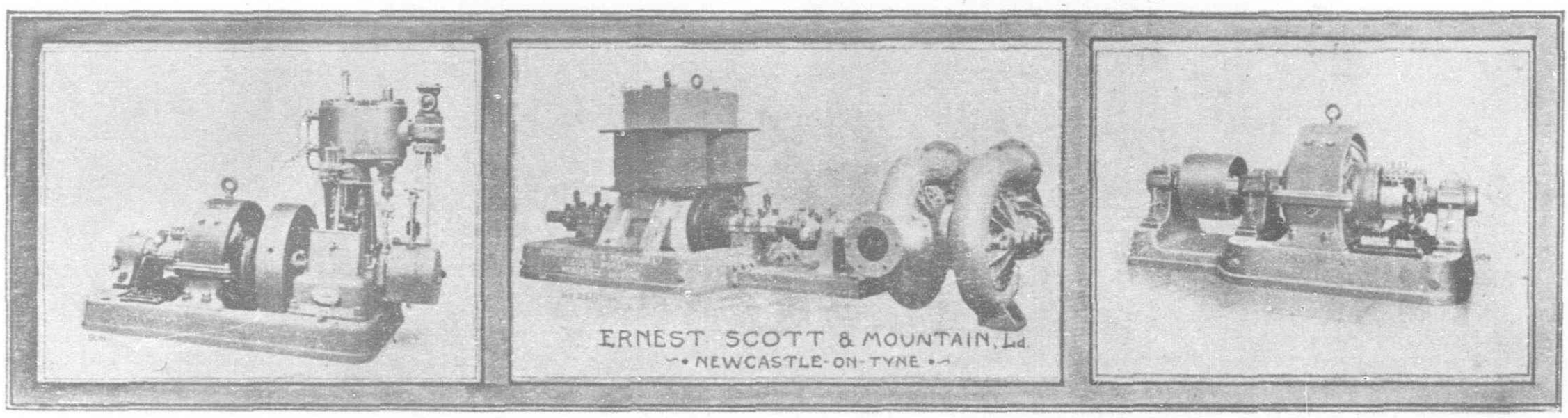
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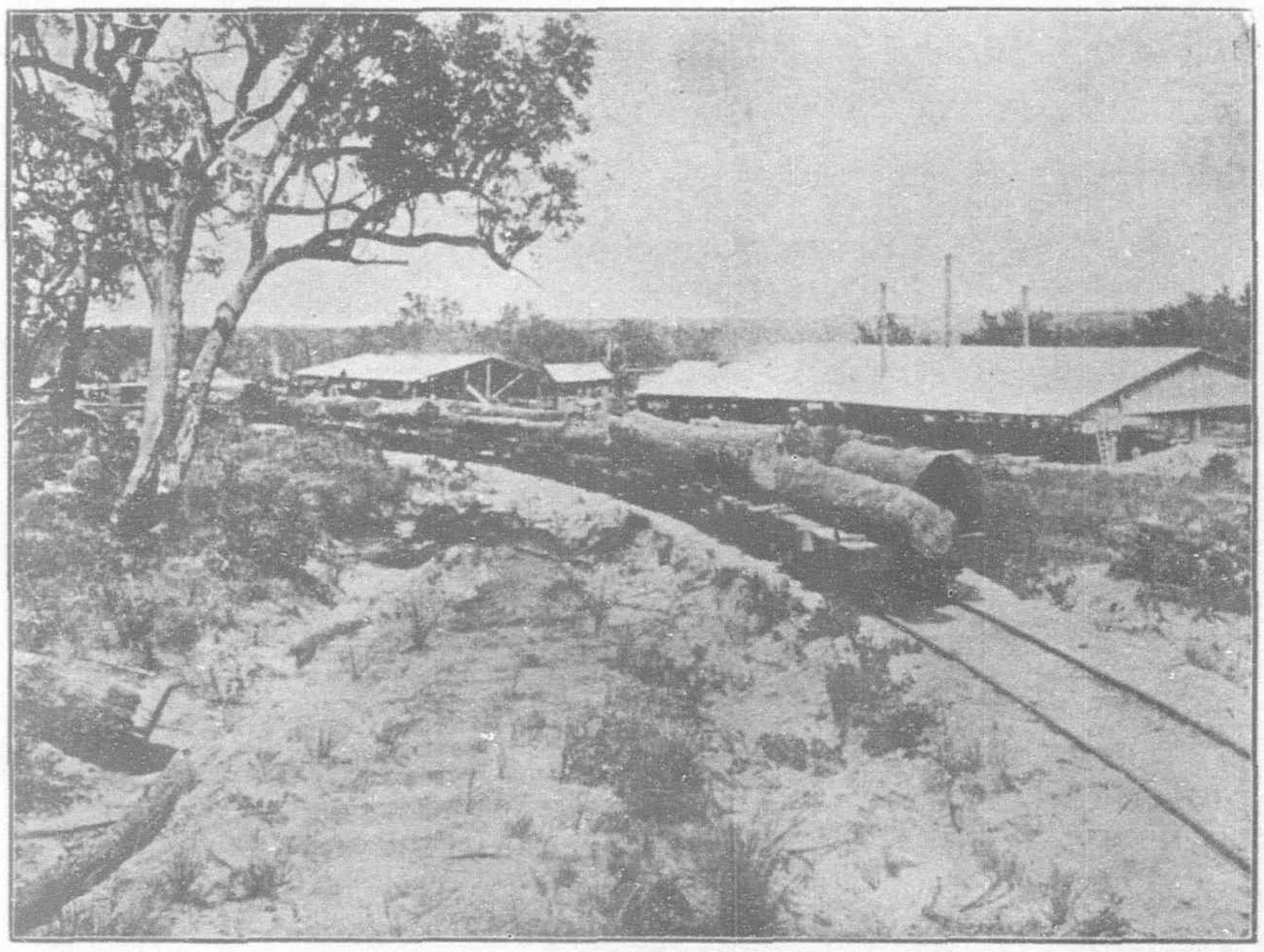
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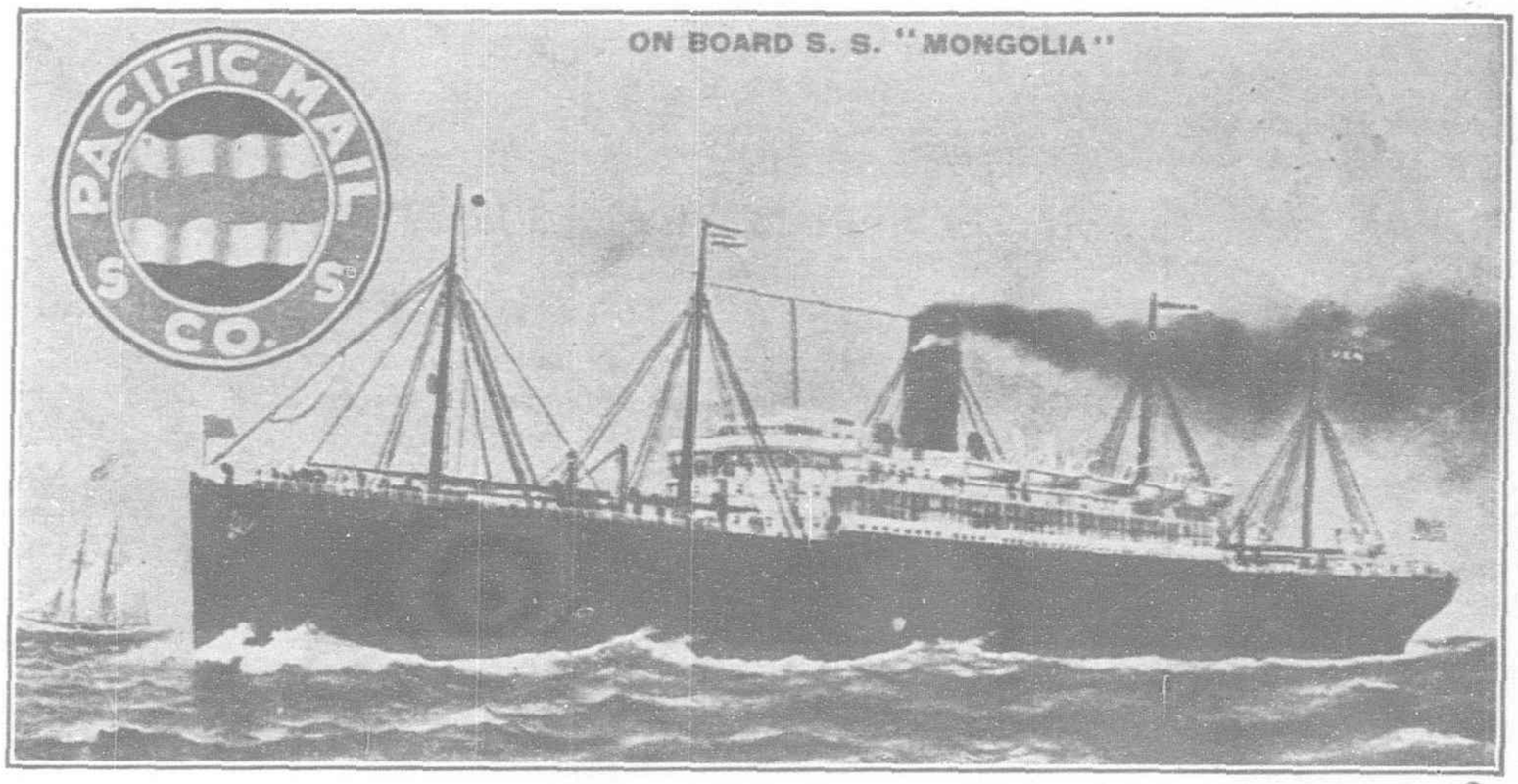
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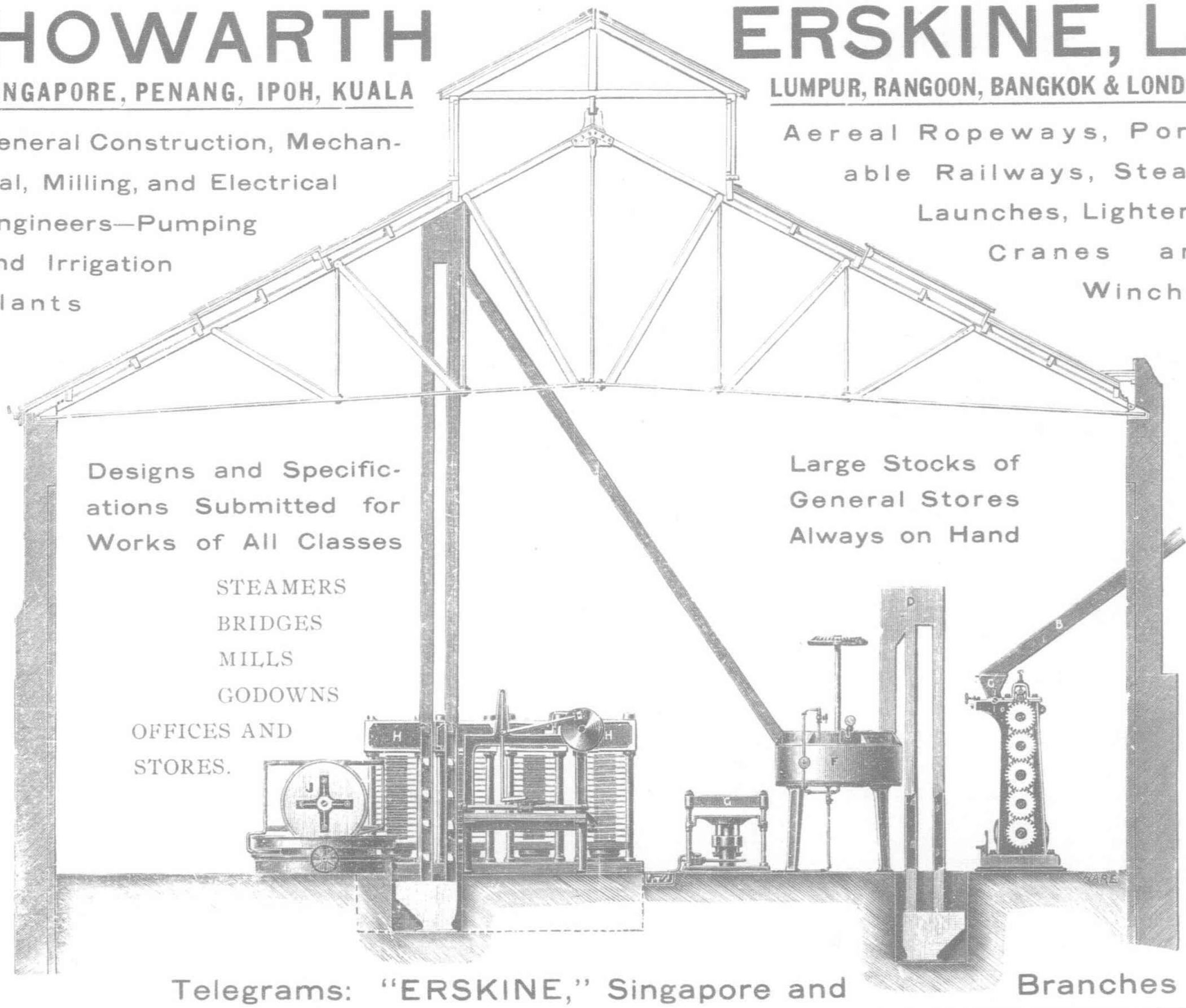
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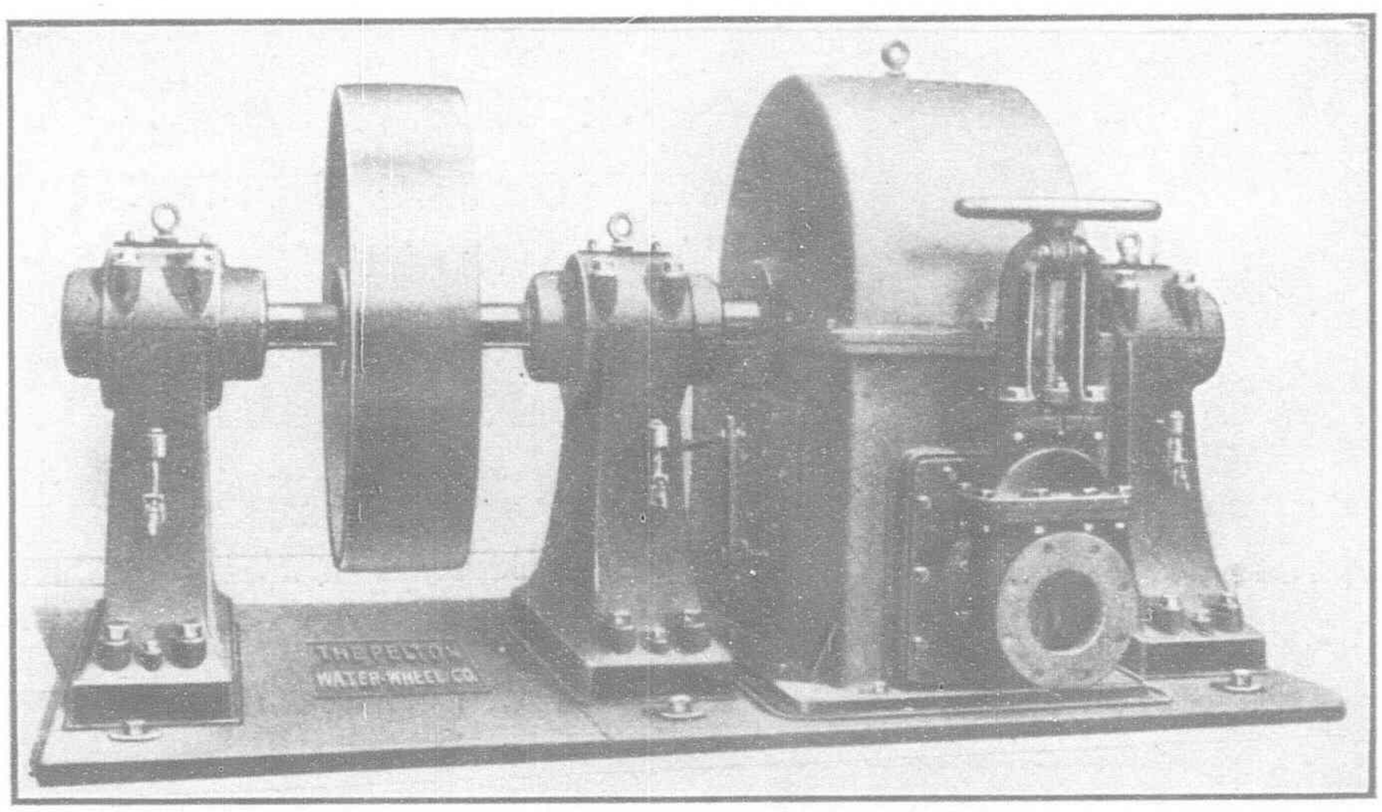
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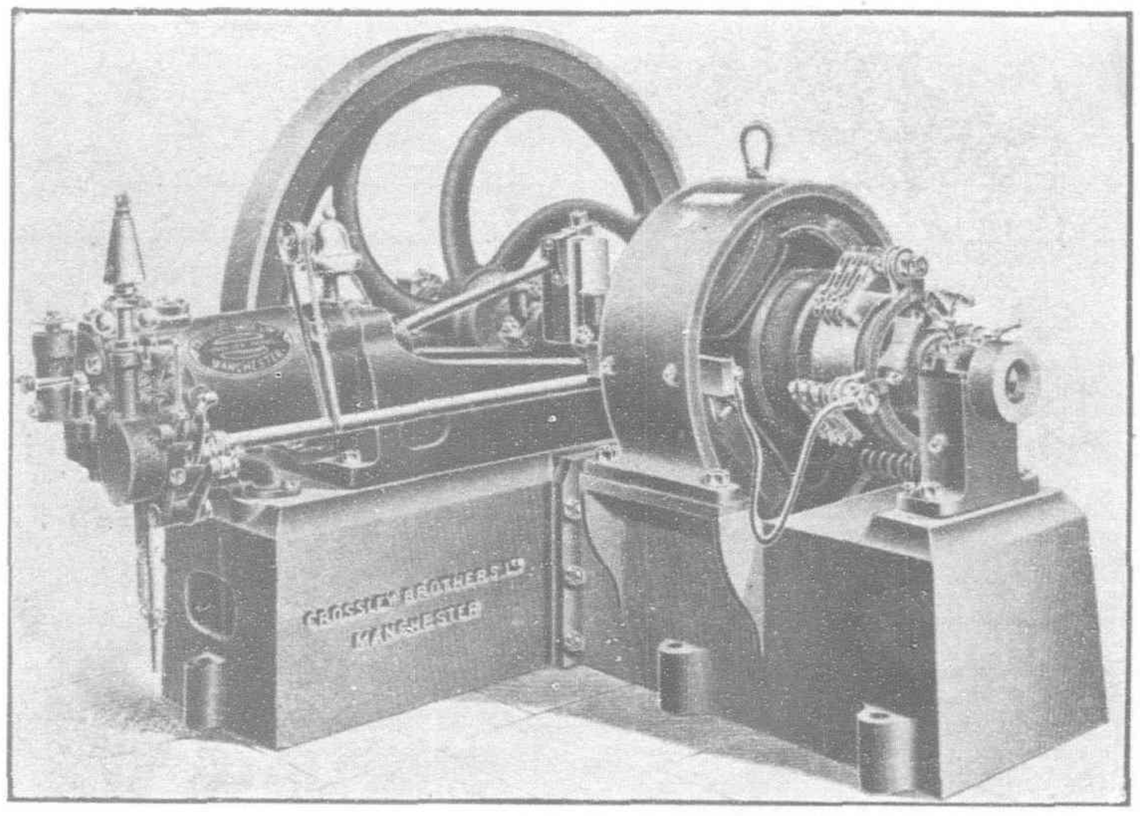
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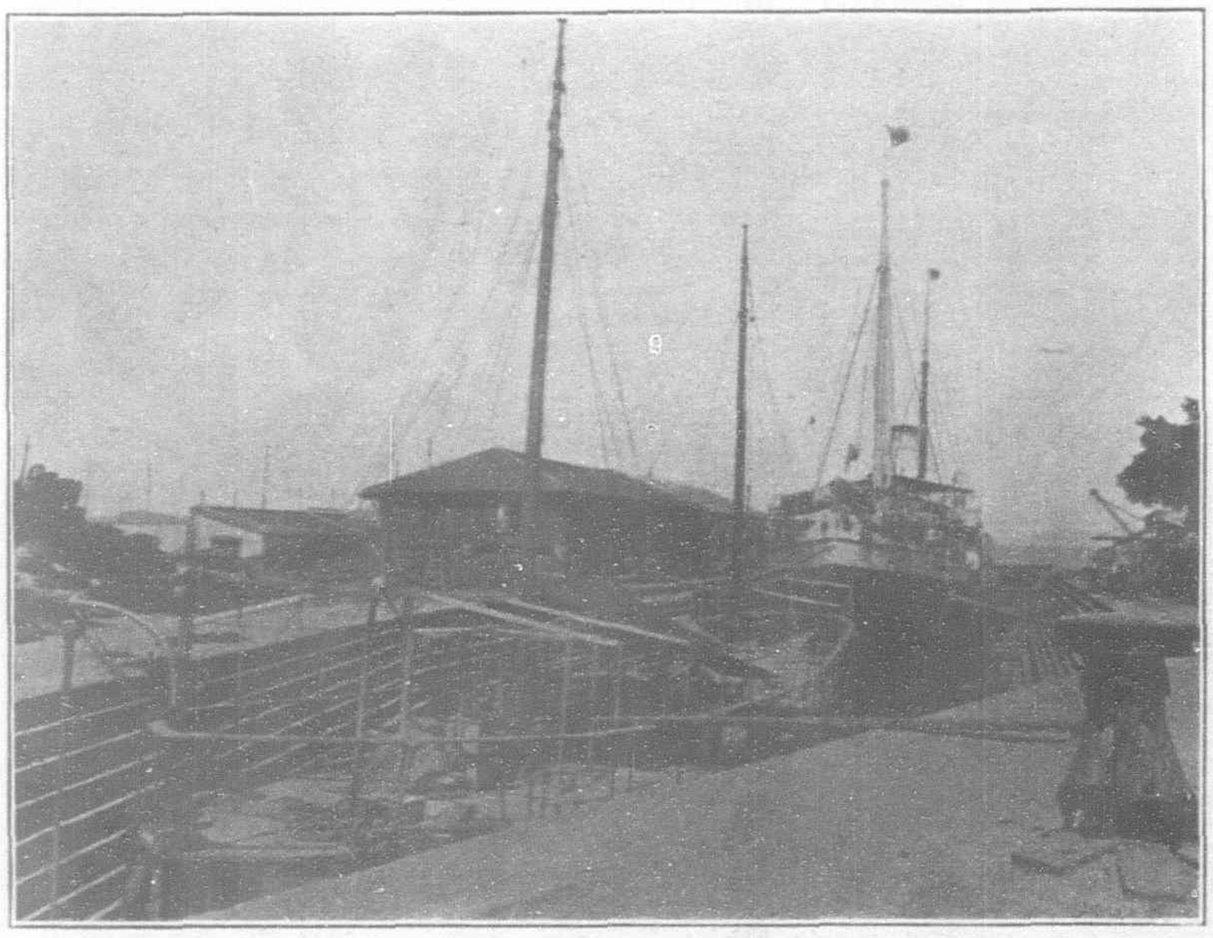
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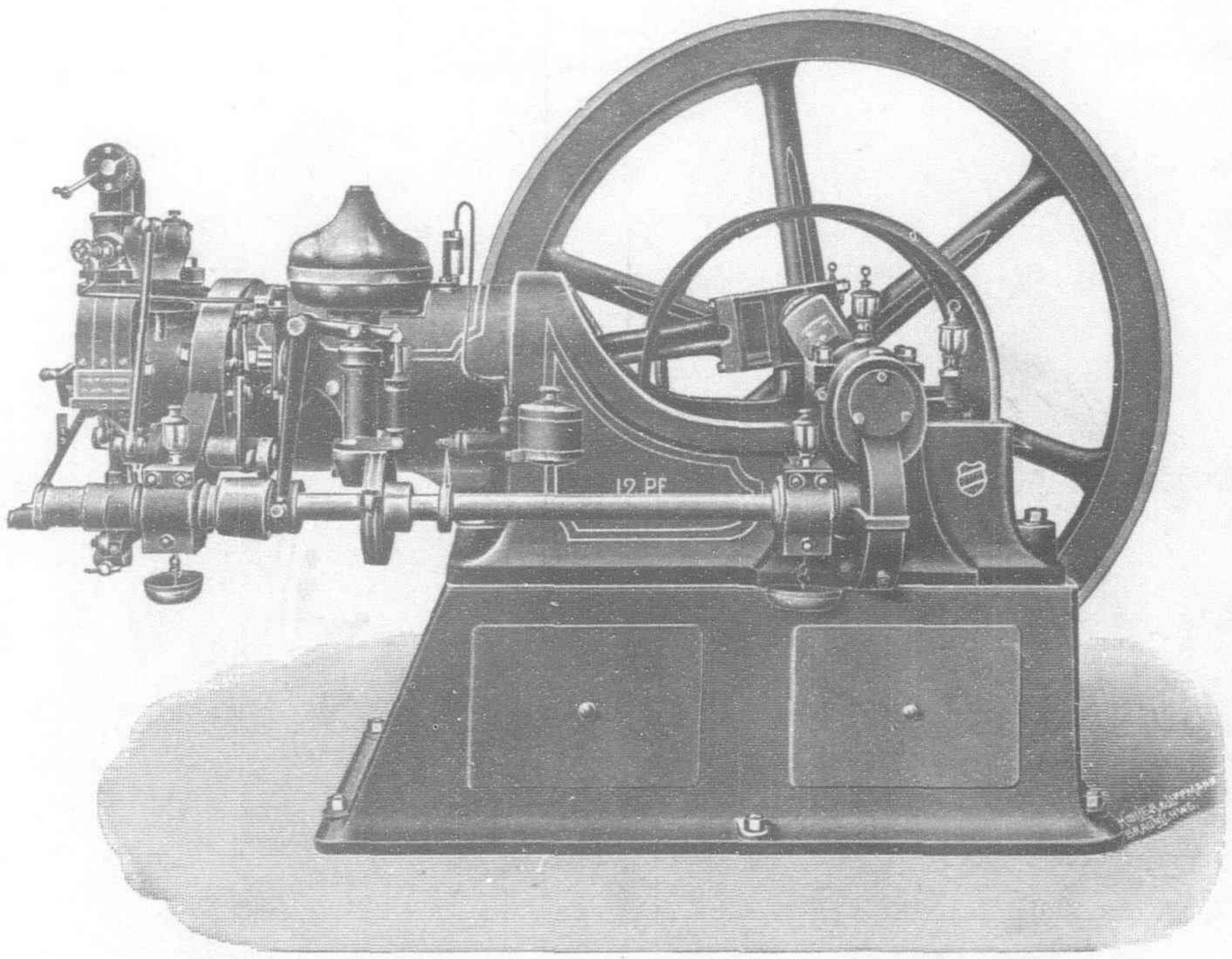
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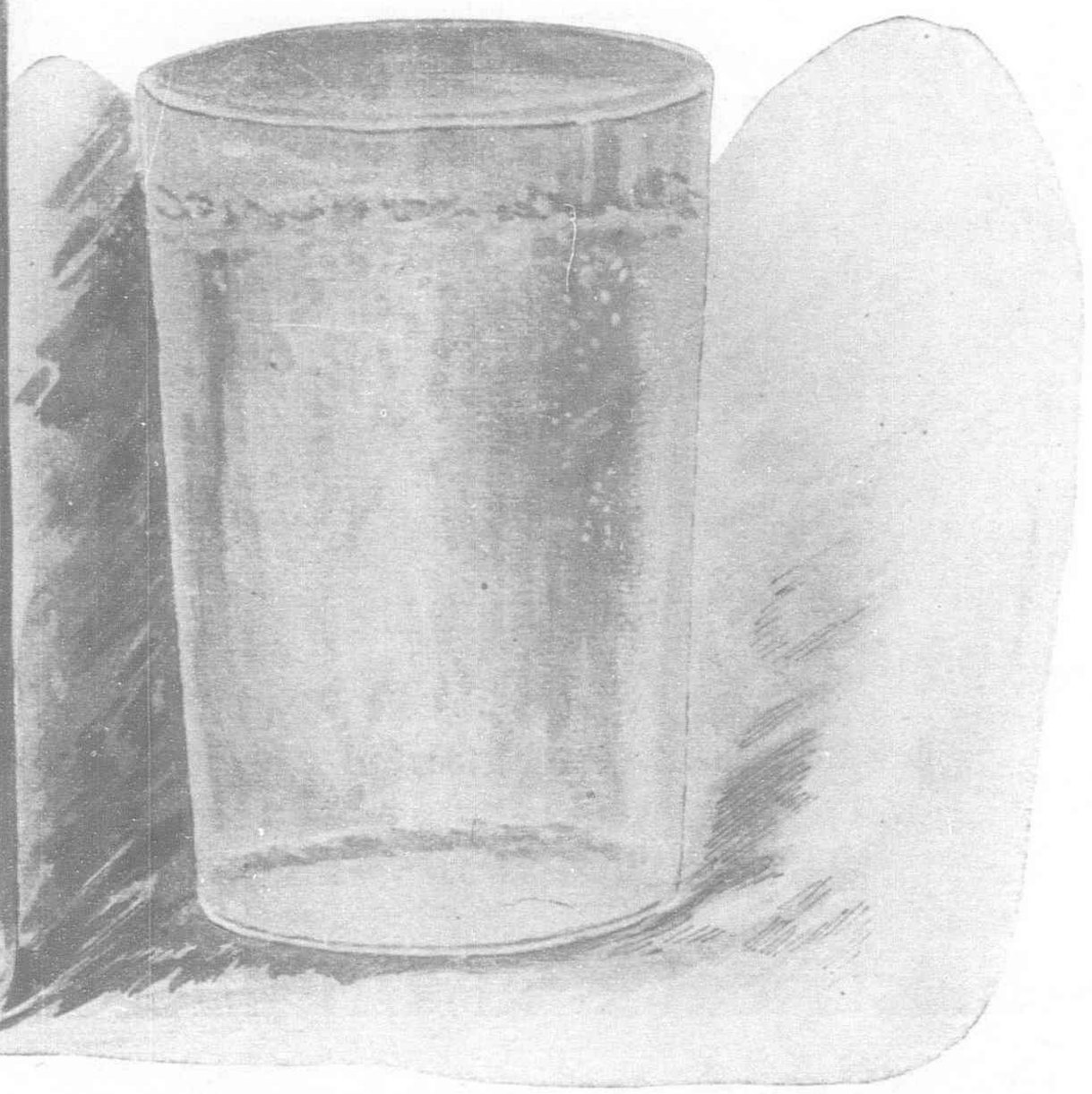
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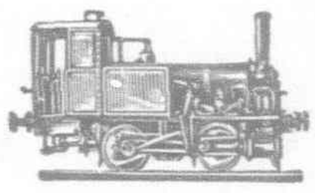
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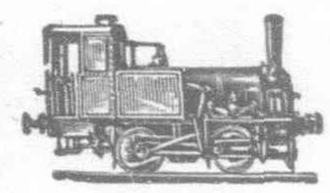
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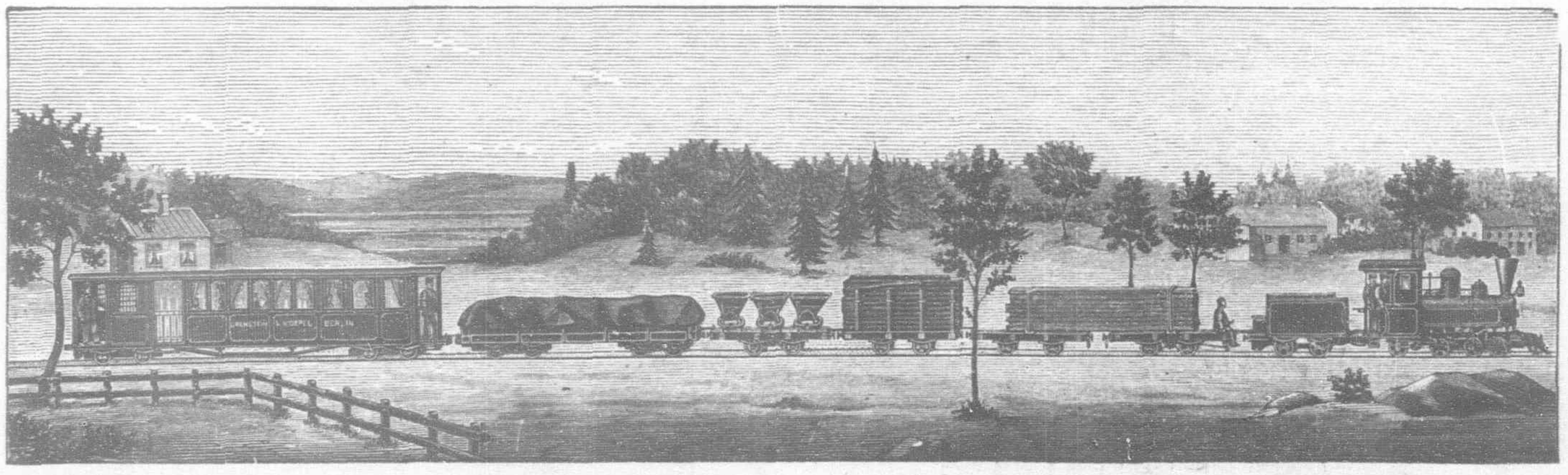




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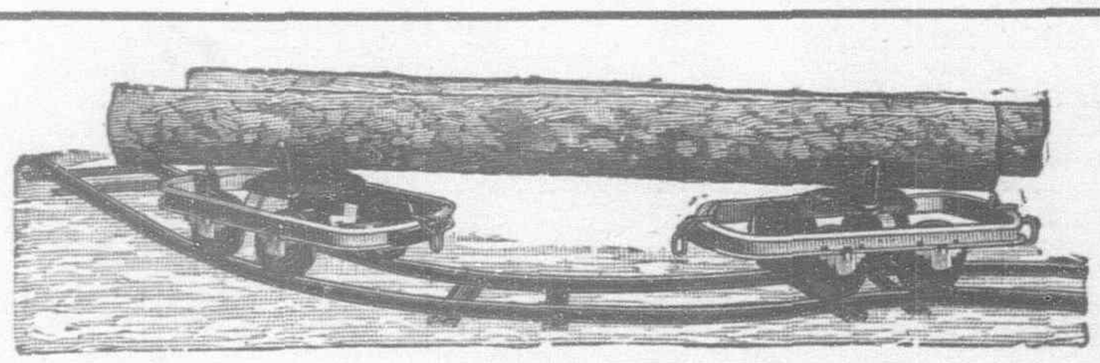
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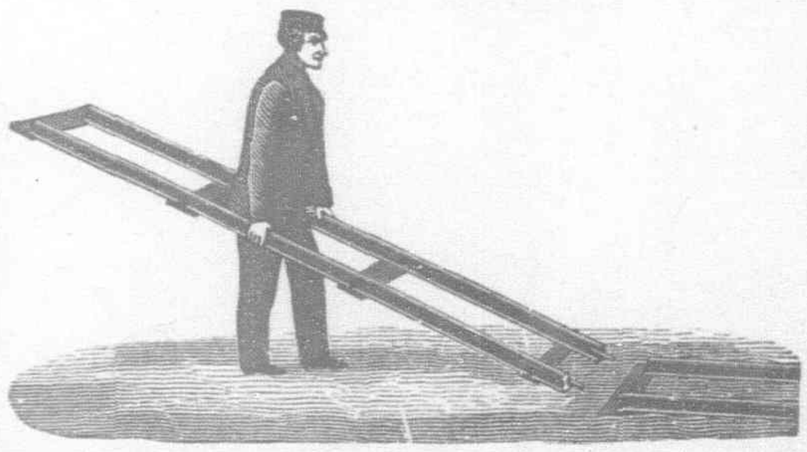
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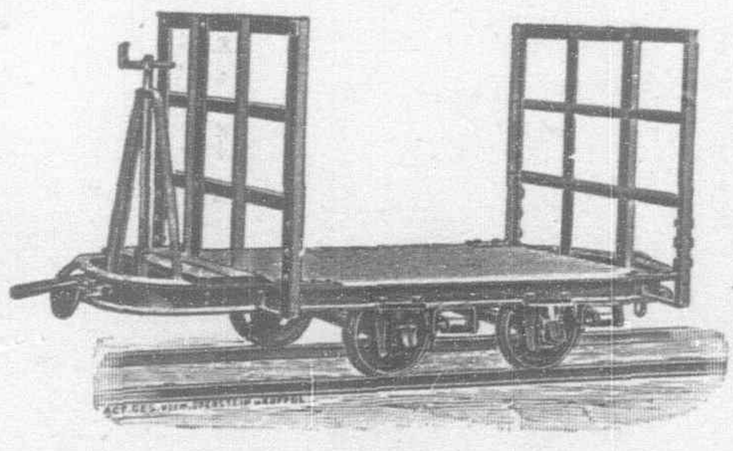
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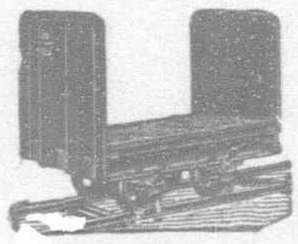


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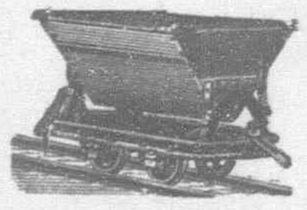
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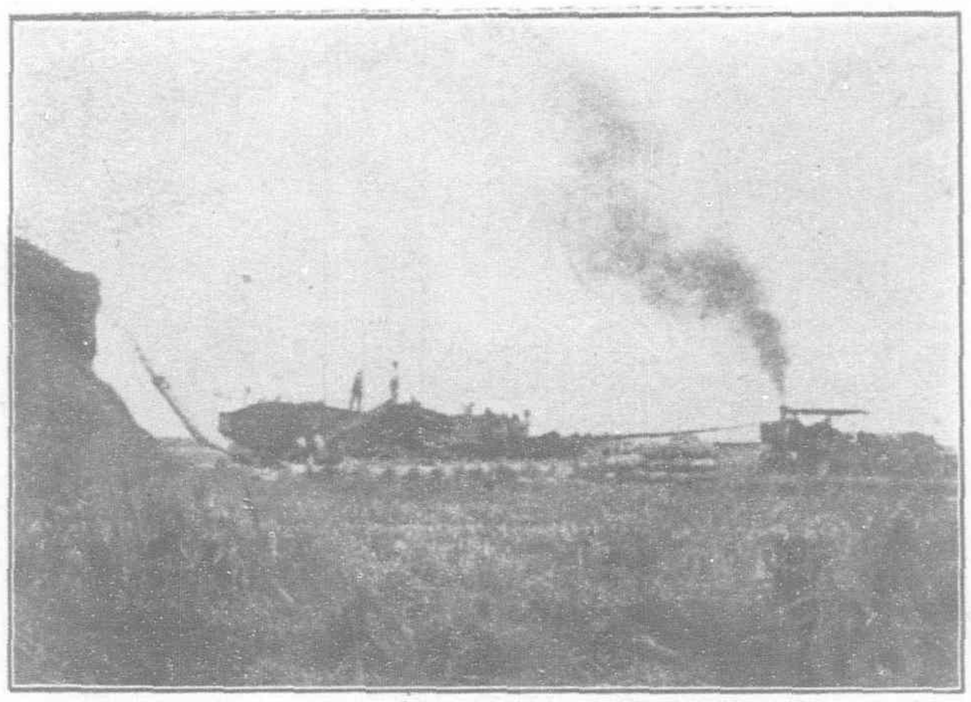
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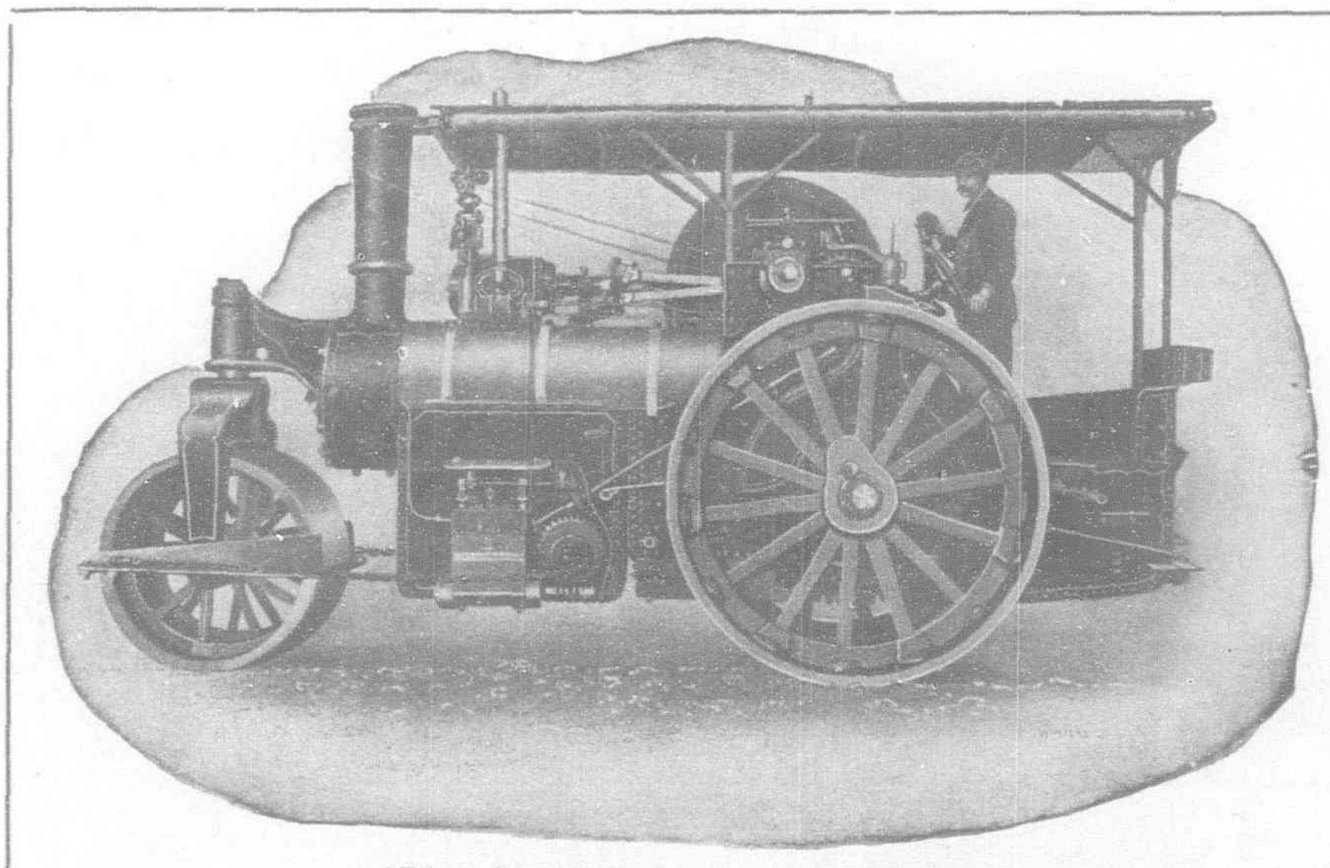
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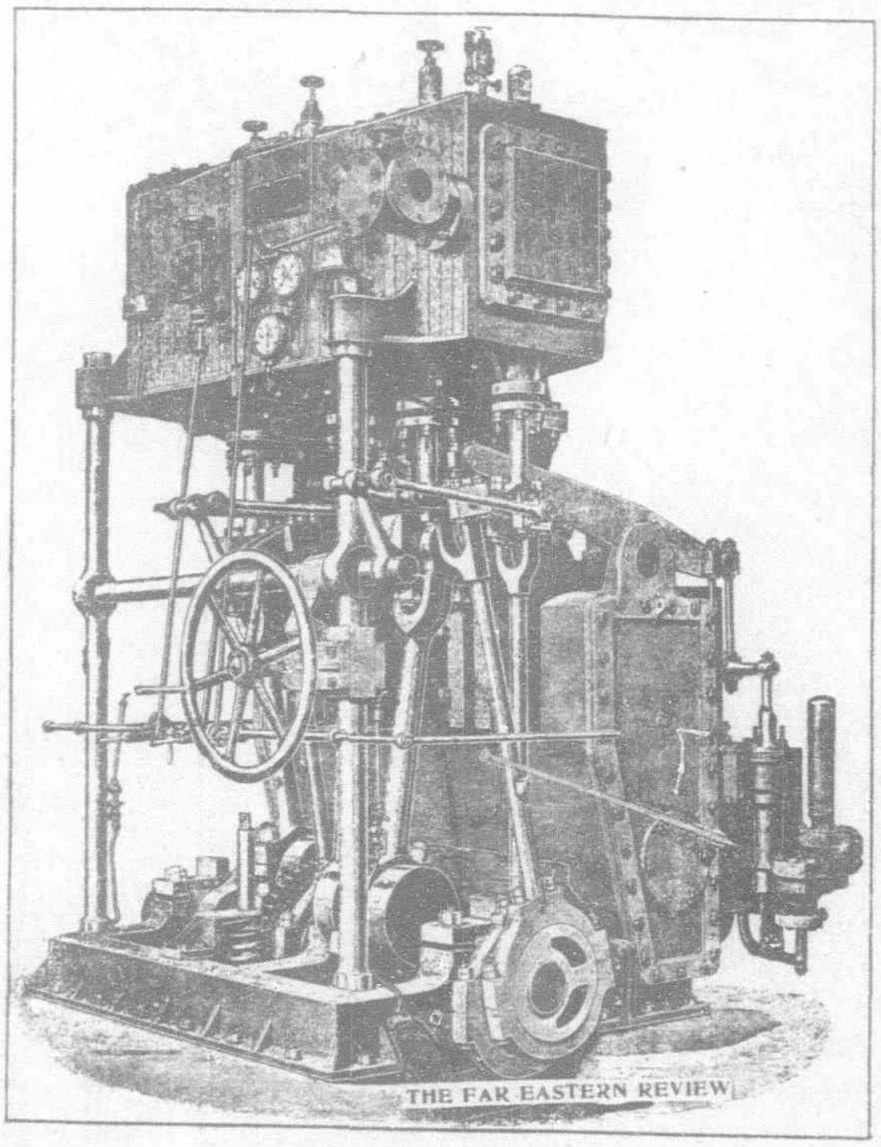


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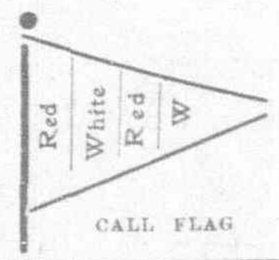
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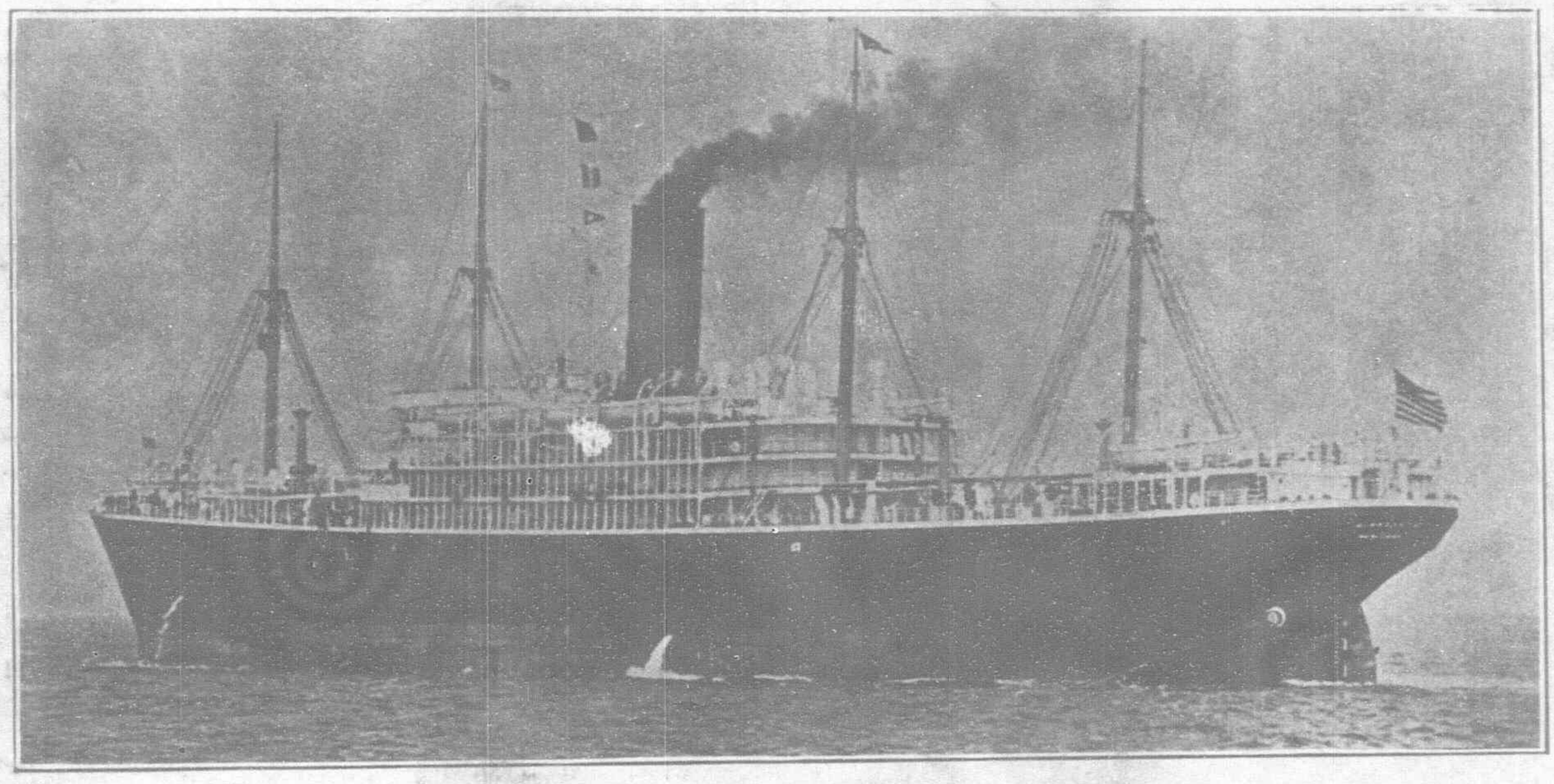
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